Coal Age

OCTOBER, 1955

A McGRAW-HILL PUBLICATION—PRICE 50c

Good Management

Here's a formula that will help you become a better mine official, offered by a veteran operating man. p 60

Full Contents . . . p 5

How TCI Investigates Bolted-Roof Falls . . . p 54

This complete M-S-A mining area coverage gives you the advantage of LOCAL stocks and service

There are few industries where prompt service and "at hand" sales facilities are more vital than in the mining industries. Continuous production is your prime concern—lost time due to delayed shipments, emergency need of repairs or parts for equipment can be avoided by the use of established M-S-A local stocks and trained personnel.

Sixty-eight representatives in twenty-two states and Canada make it their business to see that M-S-A customers have what they want when they need it. Which proves again that our slogan . . . *"When you have a safety problem, M-S-A is at your service. Our job is to help you."* . . . means what it says, wherever you do business. We'll be happy to tell you more about M-S-A Service, and M-S-A products.

MSA
SAFETY EQUIPMENT HEADQUARTERS

When you have a safety problem, M-S-A is at your service. Our job is to help you!

MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 77 Branch Offices in the United States and Mexico

MINE SAFETY APPLIANCES CO. OF CANADA, LTD.
Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S.

Speaking of "machines

HOW ARE YOU PROTECTING THE

This "machine of the future" is the Pinwheel, a tiny helicopter created by Rotor-Craft Corporation of Glendale, California, for the Armed Services. It is the first to use rocket power. In spite of its small size it is extremely high in performance. Can use a telephone booth for a "hangar" when folded. Special lubricants required. Photo courtesy Rotor-Craft Corporation, Glendale, California

Here's a glimpse of tomorrow, when Daddy will hop into his helicopter to go to the office, or Mama will go shopping, or Junior will have his own "jalopty" to go a-courting. Meanwhile . . . . the problem of TODAY is the "future" of your costly mining machinery . . . . a future you can PROTECT with the choice of the right quality lubricants.

HULBURT OIL & GREASE COMPANY

Specialists in Coal Mine Lubrication

PHILADELPHIA, PA.

with a future" . . .

FUTURE OF YOUR MINING MACHINES?

Hulburt

QUALITY LUBRICANTS

You just can't say "to helicopter with it" and argue that all good lubricants are alike. Special conditions call for special lubricants. The BEST protection you can get for the hundreds of thousands of dollars you've invested in your coal mining machines is HULBURT QUALITY LUBRICANTS. Don't take our word for it. Ask regular Hulburt users (we'll be glad to supply their names). Your mining machines will go on producing top tonnage tomorrow and tomorrow and tomorrow, if you call in a Hulburt Lubrication Engineer TODAY.

Coal Age

OCTOBER • 1955

Next Month in Coal Age

New Ideas Pay off At Trotter Coal Co.

How a low-cost compact friction-type hoist handles specially designed double-deck cage in a 72-in borehole at a new manshaft of the Bunker mine. With the new lost-cost installation Trotter Coal has been able to save an average of 45 min in travel time and increase mine output.

Planning for 1960

The upswing in coal production is well on its way, with an annual output of 750,000,000 tons forecast as probable by 1965. Such an outlook, though pleasant to contemplate, spotlights various industry problems, such as maintaining the necessary production capacity, keeping mining costs down and improving merchandising and selling methods. What these problems involve and how they affect the industry are the subject for a special Coal Age staff-written analysis appearing next month.

Snaking Conveyor Boosts Longwall Output

Dominion Coal Co., Ltd., teams a British "Python" conveyor with its own Dosco design of continuous miner. The result worth studying is a jump in longwall operating efficiency and an increase in coal recovery.

New Tax Laws: How Coal Benefits

Here's an analysis of the latest revisions of the Internal Revenue Code and their effect on coal mining operation and profits. The changes are numerous and important and the latest developments on depletion allowance, royalties, property improvements, etc. may suggest large savings for your company.

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WITH *Texaco Multifak*, you can simplify lubrication of anti-friction and sleeve-type bearings in locomotives, cutters, loaders, motors and other equipment. And because you need *just one lubricant* for all these jobs, you'll save time, avoid errors, reduce costs.

Texaco Multifak is a premium-quality grease with excellent pumpability even at low temperatures. It is oxidation-inhibited, has high mechanical stability and resists water and rusting. *Texaco Multifak* provides effective lubrication and maximum protection over a wide temperature range.

To best lubricate and protect wire rope and open gears, use *Texaco Crater* — it keeps rope strong longer, assures smoother operation and longer life for gears. If you prefer fluid application, use *Texaco Crater X Fluid* for both purposes.

Let a Texaco Lubrication Engineer help you increase efficiency and reduce costs in every phase of your operation. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, New York.

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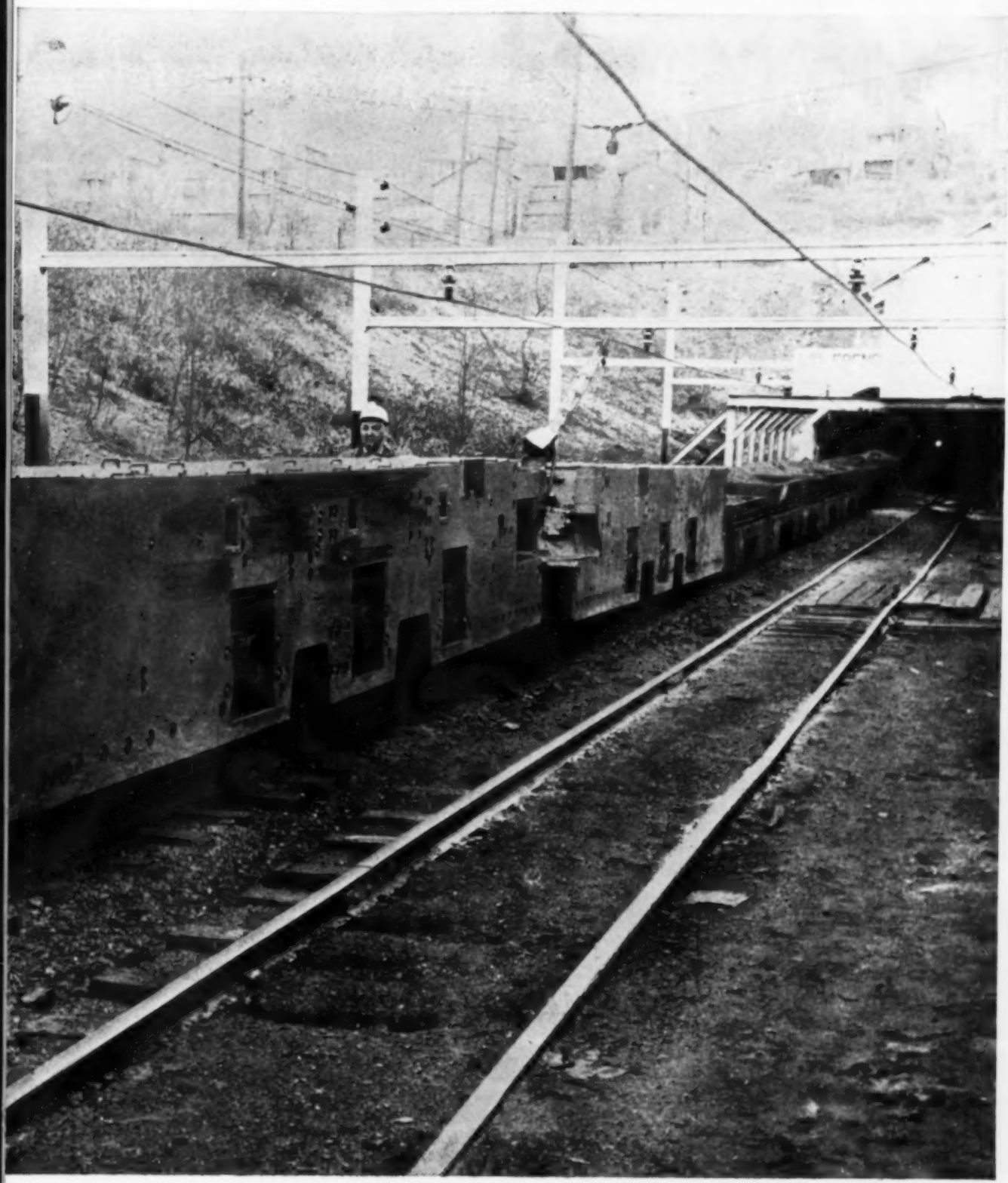


LUBRICANTS for the Coal Mining Industry

JOY MINING TEAM

Above, left: The Joy 11-RU is a fast-tramming, fast-cutting, rubber-tired universal cutter that will shear-cut, bottom-cut, center-cut or top-cut anywhere in the seam. Only 31" high for trackless operation in medium-low coal, and equipped with field-proved Bugduster.

Above, right: The Joy Super 14-BU is in a class by itself among self-propelled mechanical loaders for medium-height seams. Built in 31½", 33" and 36" heights, with maximum loading capacity of 10 tons per minute, this dependable unit is powered and constructed on the "extra" principle throughout, for maximum speed and ruggedness in heavy duty service.

Center, left: The CD-22 Coal Drill is a single-boom hydraulic drill, 30" high. Rubber tire-mounted and readily maneuverable, this mobile Joy drill permits fast and accurate hole positioning. Infinitely variable hydraulic control of feed and speed assures fast drilling under all conditions.

Bottom, left: The Joy 6-SC Shuttle Car can make its round trip from the face in less time than any other car in its class. Has exclusive features of drive, steering, braking and control that mean greater speed, power, maneuverability, safety and dependability. Built in heights from 29" to 38½" for capacities from 100 to 180 cu. ft.

HITS 870-TON SHIFT

JOY 11-RU WITH BUGDUSTER, CD-22, SUPER 14-BU AND 6-SC COMBINATION AVERAGES OVER 500 TONS PER SHIFT

Equipment Team: one Joy 11-RU Universal Cutter with Bugduster, one Joy CD-22 Coal Drill, one Joy Super 14-BU Loader and three Joy 6-SC Shuttle Cars.

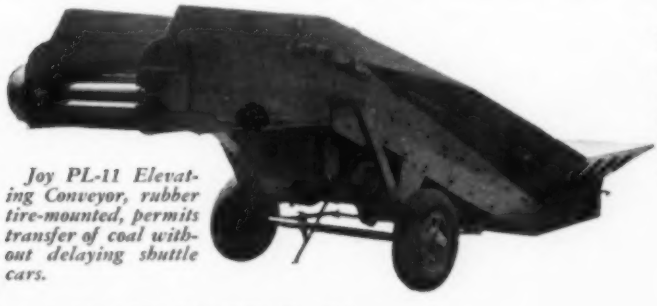
Number of Men: 13-man production crew.

Operating Conditions: This equipment is being used in a West Virginia mine, working in a seam varying from 4½ to 6 feet high. The seam contains a band of hard slate 4″ to 8″ thick. Grades encountered vary from 3 to 4 per cent. The top is slate and laminated sandstone, bolted with expansion bolts; and the bottom is firm fireclay. The average shuttle car haul one-way is 275 feet, with a maximum one-way trip of 500 feet. A Joy PL-11 Elevating Conveyor receives coal from the shuttle cars at the mine car loading point.

Performance Record: Average production over a month's period has exceeded 500 tons per shift. Maximum production reached a high of 870 tons per shift.

★ ★ ★

No matter what your requirements may be, there is a Joy high-capacity equipment team that can help you show a profit, or increase your margin. For any system, including modern continuous mining with continuous haulage . . . or for any seam condition, Joy has a *field-proved* answer for you. ● *Let us work with you!* **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*



Joy PL-11 Elevating Conveyor, rubber tire-mounted, permits transfer of coal without delaying shuttle cars.

WRITE FOR BULLETINS, OR

Consult a Joy Engineer

W&D CL5302

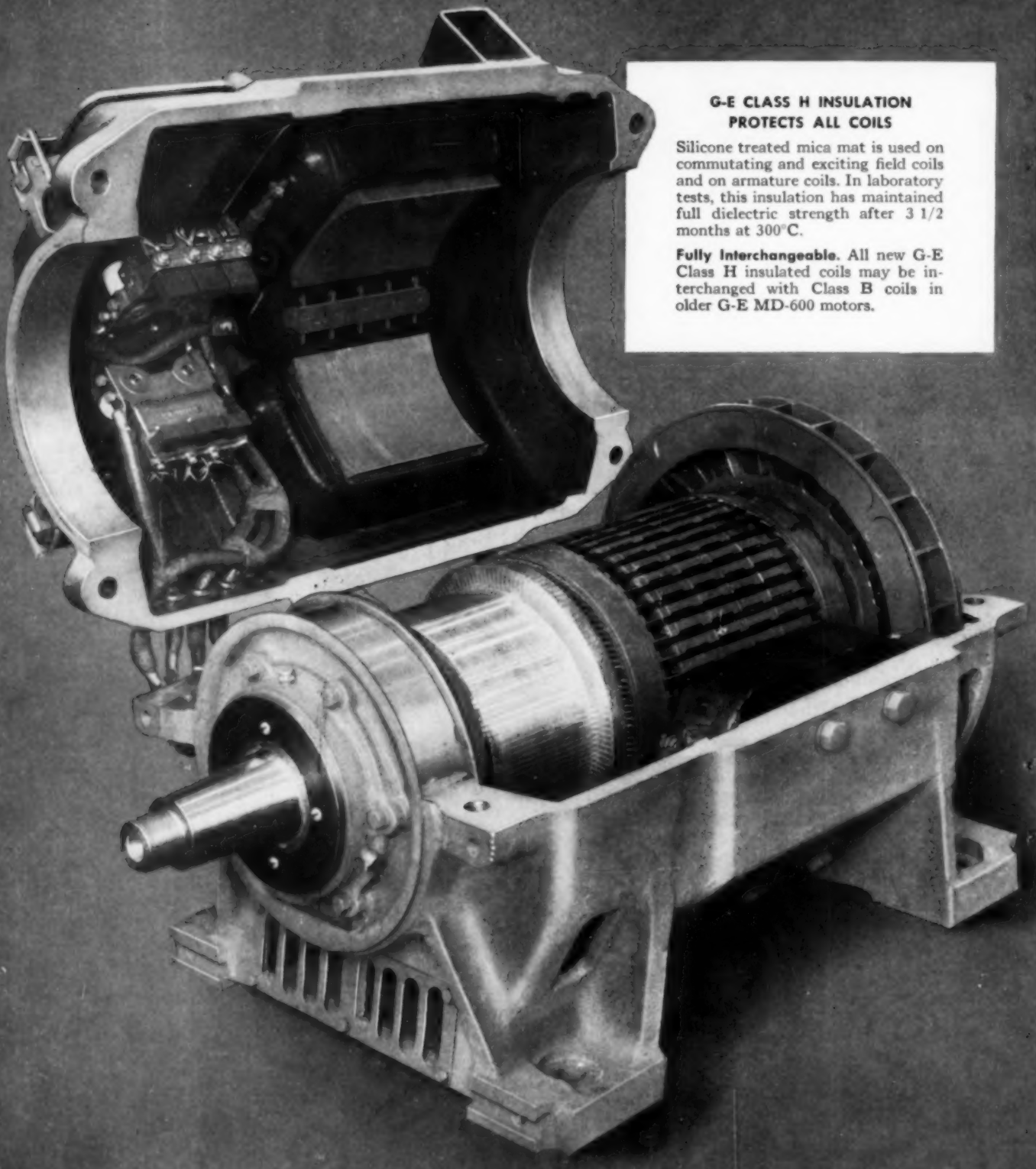
JOY

WORLD'S LARGEST MANUFACTURER OF UNDERGROUND MINING EQUIPMENT

PROGRESS IN
DIRECT-CURRENT DRIVES

NOW! Roastouts

NEW G-E MD-600 MOTORS



G-E CLASS H INSULATION PROTECTS ALL COILS

Silicone treated mica mat is used on commutating and exciting field coils and on armature coils. In laboratory tests, this insulation has maintained full dielectric strength after 3 1/2 months at 300°C.

Fully Interchangeable. All new G-E Class H insulated coils may be interchanged with Class B coils in older G-E MD-600 motors.

Virtually Eliminated on . . .

WITH CLASS H INSULATION

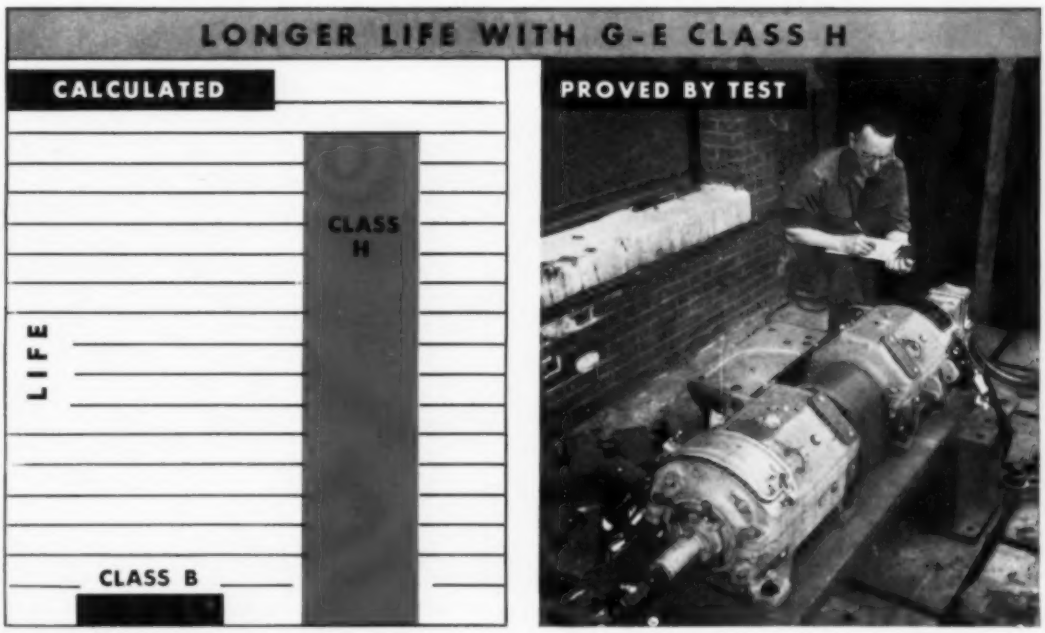
G.E. offers—in all MD-600's—Class H Insulated Coils

WHAT IS CLASS H? General Electric research has developed a combination of inorganic and silicone materials for a new insulation system now used in all MD-600 motors. These Class H materials will withstand temperatures up to 180°C continuously.

BETTER FOR HEAVY DUTY. Auxiliary mill motors often encounter unexpected high ambient temperatures, unforeseen extended duty or emergency conditions. Any one of these can cause "roastouts" from temperatures higher than the insulation capacity. The new G-E Class H insulation will resist up to 50°C more than Class B, resulting in longer motor service.

REWINDS ELIMINATED? On normal duty, insulation failure may be eliminated as the limiting factor in continuous armored motor service. Engineers calculate that each 10°C rise in temperature reduces the life of a given type of insulation by half. *Since G-E Class H will withstand 50°C higher than Class B, its life* **at the same temperature** *should be increased 2⁵ or 32 times!*

YOUR G-E SALES REPRESENTATIVE HAS COMPLETE INFORMATION. Contact him at your nearby G-E Apparatus Sales Office, or write Section 812-1, Direct Current Motor and Generator Department, General Electric Company, Erie, Pennsylvania.



ENGINEERING STUDIES indicate that under identical operating conditions new G-E Class H insulated coils in MD-600 motors will last up to *32 times* as long as conventional Class B coils. Insulation failure may be eliminated as the limiting factor in continuous auxiliary mill motor service.

ACTUAL TEST with Class H and Class B motors coupled together *proves to date* the new insulation will last more than twice as long as the old. After burning out two Class B insulated motors, the one with Class H coils is still operating under exaggerated load, vibration and atmospheric conditions.

Progress Is Our Most Important Product

GENERAL ELECTRIC

push your coal production UP

with this hard-working JEFFREY team

Jeffrey 70-UR Universal Cutter for bottom, top and shear cuts

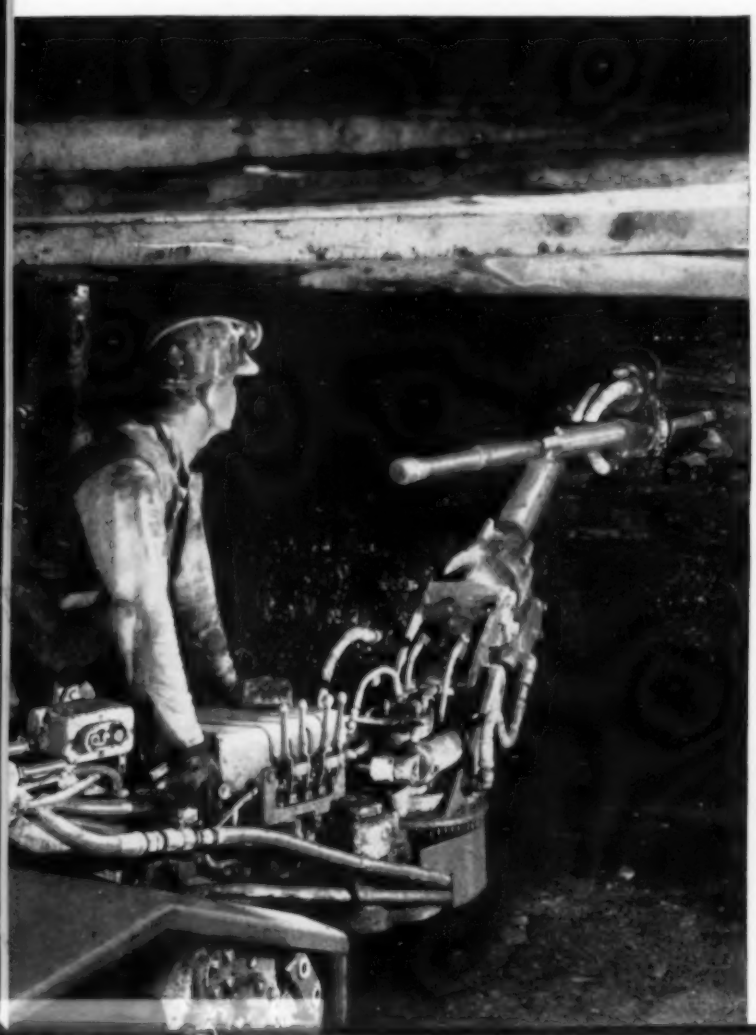
Head and cutter can be rotated 360° in either direction and positioned to make any kind of cut, any place in the seam. From one location, the 70-UR Cutter makes a 30-foot horizontal cut (using a 9-foot cutter bar) or a shearing cut 5'5" to either side of the machine's centerline. No wonder mine superintendents brag about its tonnage-producing ability!

Operators report smooth and positive traction for sumping, even when cutting at extreme range. The 70-UR's wide wheel gauge, long wheel base, low center of gravity and large pneumatic tires give sure-footed stability. Maintenance men say that its rugged construction reduces downtime and cuts upkeep costs.

Jeffrey 81-A Loader for high capacity loading

From both a production and a maintenance standpoint, the 81-A Loader is a superior machine. It is well balanced and flexible, and is easily maneuvered; trams at 137 FPM and can be turned in its own length. The conveyor swings 45° either side of center and elevates properly to load shuttle cars on the straight and in break-throughs. It has a rated capacity of 8 TPM and a maximum capacity of 10 TPM.

Maintenance is simplified on the Jeffrey 81-A Loader because every motor and gear case is a separate, detachable unit. This kind of unit construction is used throughout, resulting in rapid replacements and lower upkeep costs.



Jeffrey 56-FHR Face Drill for shot hole drilling

This single-boom drill provides a high degree of operating flexibility. It is rubber-tire-mounted and self-propelled by two hydraulic motors. Another operates the cable reel. The drilling head can be swung by finger-tip control to any desired position for shot hole placement. Drilling range is 7′2⅝″ vertically and 13′1¾″ horizontally.

The auger can be withdrawn by power without reversing the direction of rotation of the auger. This action clears the hole of all cuttings, leaving it ready for insertion of the powder or blasting cartridge.

OTHER JEFFREY EQUIPMENT FOR UNDERGROUND SERVICE:

Continuous Mining Machines • Conveyors • Shuttle Cars • Locomotives • Fans and Blowers
Descriptive literature sent upon request. The Jeffrey Manufacturing Co., Columbus 16, Ohio

JEFFREY

MINING • CONVEYING • PROCESSING EQUIPMENT
TRANSMISSION MACHINERY • CONTRACT MANUFACTURING

NEW SUPER RAYNILE CONVEYOR BELT 400% STRONGER

Provides the economical answer to transporting coal and other bulk materials over long distances and up steep slopes.

This remarkable new Hewitt-Robins conveyor belt reinforced with the revolutionary synthetic fabric, Super Raynile, makes possible an entirely new concept in single-section conveyor application. It solves difficult materials handling problems where topography and other conditions require the use of a long single-length conveyor.

Already in service, Super Raynile has the highest operating tension of any conventional carcass belt. Because of its tremendous tensile strength, 400% greater than conventional cotton reinforced belts, a single conveyor section *5¾ miles long* can be built over level terrain to carry material at 400 TPH using only a 6-ply Super Raynile belt 30 inches wide. This same belt can also lift material from ground level to a height of 830 feet.

The new Hewitt-Robins Super Raynile conveyor belt is highly flexible and pliable despite its great strength. Its cost is less than steel-reinforced belts and Super Raynile can easily be spliced in the field more quickly, more economically and without the specialized equipment required to splice steel-reinforced belts.

Super Raynile belt is available in a wide range of specifications . . . widths up to 72" — thickness up to 15 plies.

Learn more about this new long-length, long-life conveyor belt. Contact your local Hewitt-Robins Industrial Supply Distributor (see Classified Phone Book), or write direct to "Super Raynile Belt", Hewitt-Robins Incorporated, Stamford, Connecticut.

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Conveyor Belting—Industrial Hose—Conveyor Machinery—Vibrating Screens—Vibrating Conveyors—Design, Manufacture, Engineering and Erection of Complete Bulk Materials Handling Systems.

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OWNERS REPORT THE DECISIVE DIFFERENCE IN NEW

TD-18A Performance

"It can self-load and deliver fastest" "International TD-18A improvements like the new 300% stronger track frames and cartridge-type roller seals increase production, machine life, and operating ease. As for power, our new TD-18A can self-load the 8-11 cubic yard scraper and deliver fastest of any crawler we ever had." *Here's proof extra traction matches the TD-18's power increase!* G. W. Owen, McDonough, Ga.

"Every load's a payload" "My TD-18A International Drott is built for the operator's comfort. I know, because I'm the operator. It has 360° visibility which no other loader has. Every load is a payload." *No other outfit built gives you the TD-18's combination of power, visibility and responsive controls.* V. S. Steffes, Owner, Earthmoving and Clearing, Batavia, Illinois.

"Operators fight for new TD-18A!" "The TD-18A's were always good—fast, trouble-free performance and low operating cost made me money. The new model TD-18A is stronger and really planned for the man in the seat. It has operators fighting for it." Big, wide, comfortable cushions; hydraulic steering control boosters, and levers, conveniently grouped on the roomy, non-skid deck! *No wonder TD-18A handling ease turns "skinners" into high-producing operators throughout the day!* M. B. McKee, McKee Construction Co., Chickasha, Oklahoma.

"Uranium search toughest of all!" "I'm in the hardest work I know of—building roads into uranium claims, rim-cutting development work. The TD-18 we used for six years had the motor overhauled after five years, and when we traded a year later the transmission and drives were still original equipment. I believe this heavied-up new model TD-18A is by far the best of all." *Advances like the new bridge-strong welded track frames, stronger transmission and exclusive cartridge-type track roller seals back his judgment.* O. Frost Black, Owner, Blanding, Utah.

Ease into the foam-rubber-padded, panoramic-vision seat and see the *decisive difference*. Try new finger-tip power steering, and other big *job-easing incentives* for boosting production, as developed only by International. Prove TD-18A *full-power traction*—note, too, how the gear train is beefed-up to transmit 103 drawbar hp, and then some! Measure what new *300% stronger track frames* mean *for full-capacity performance* under slam-bang conditions. Compare how new *cartridge-type track roller seals*, and other International *downtime-prevention engineering*, beat anything else on tracks. Ask for a new TD-18A demonstration!

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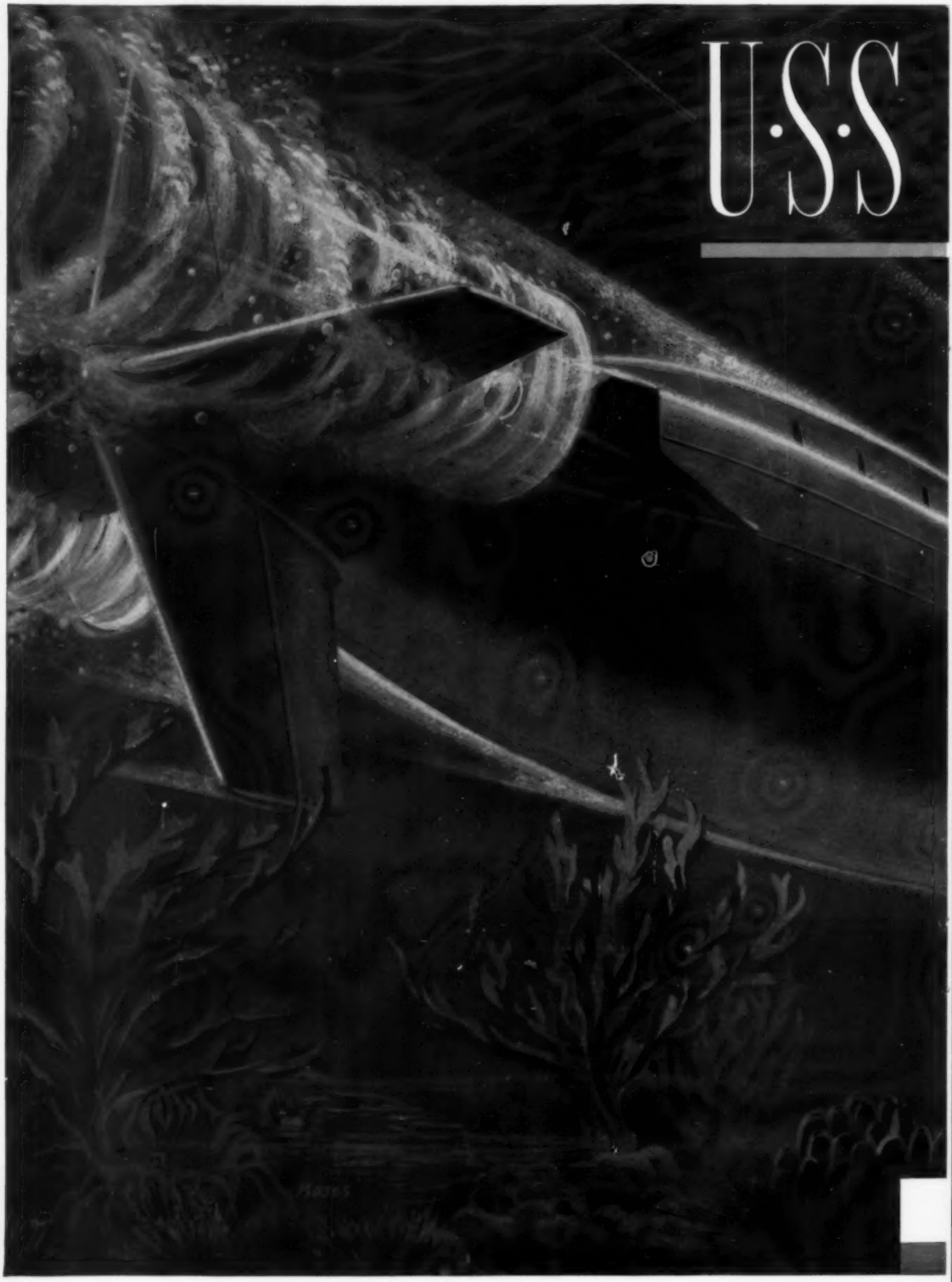
MAKES EVERY LOAD A PAYLOAD


U·S·S

Nautilus

first
atomic submarine
uses

TIGER BRAND ELECTRICAL CABLE

The Nautilus was built by General Dynamic Corporation's Electric Boat Division shipyard, at Groton, Conn. She was launched on January 21, 1954.

Very frankly, we cannot recall a more *critical* application of electrical cable than this new atomic-powered submarine. And from one end to the other, this amazing boat is laced with Tiger Brand Electrical Cable.

But here's the important thing—*you* can get the same quality that went into the Nautilus. Just call your American Steel & Wire salesman.

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special purpose wire & cable
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UNITED STATES STEEL

SPEED
that puts flexibility into stripping operations

Drilling large-diameter blast holes in a fraction of the time required with other types of drills, Bucyrus-Erie rotaries permit greater flexibility and closer co-ordination in use of stripping equipment. Here are a few reasons why these drills keep well ahead of blasting and digging.

TOOL HANDLING SPEED. In making up tool joints, a remote-controlled tool storage rack swings drill pipe into place above hole and centers it under rotary drive machinery. Rotary machinery is lowered to meet drill pipe; then rotary coupling and pin joint on drill pipe are screwed together under power. Make-up time is counted in minutes; dismantling is equally fast.

DRILLING SPEED. The entire length of each drill pipe section can be drilled in one non-stop run. Both rotary drive and pulldown force are applied at top of drill pipe and follow it all the way down. This means continuous hole production. Hole progress is fast, too, because rotation speed can be changed instantly as needed with Ward Leonard electric control, and down pressure can be varied with hydraulic control.

MOVE-UP SPEED. Crawler mounting travels easily over rough ground, up grades, and through mud. Excellent stability permits making most moves with derrick up. Set-ups are simply a matter of leveling machine again. Hydraulic jacks quickly correct machine tilt.

There are two Bucyrus-Erie rotary drills to choose from — the 40-R drills 6¾-in. to 9-in. holes — is available with diesel-electric or full electric power; the 50-R drills 9⅞- to 12¼-in. holes and is electrically powered. For detailed, illustrated bulletins, write today to —

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Wisconsin

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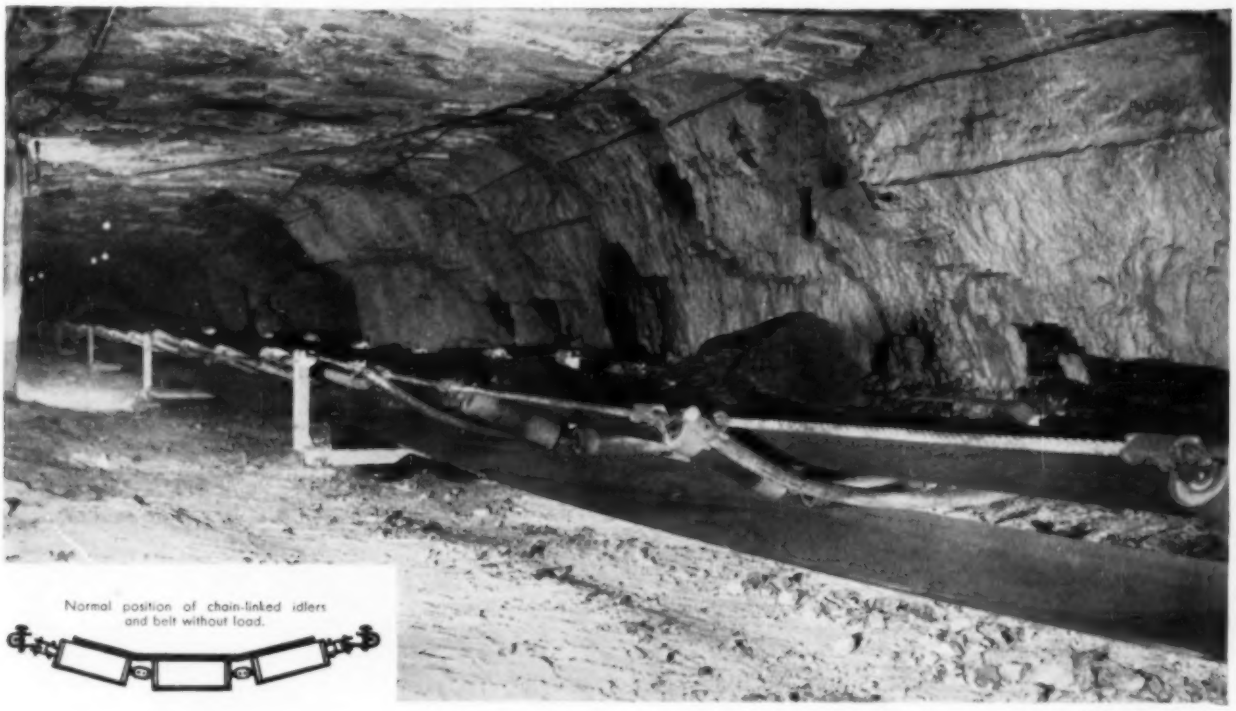
to Men Who
Shape the Earth



Normal position of chain-linked idlers and belt without load.

Idlers conform to load, absorb shock of load travel.

21289 Patents Pending

COAL NEVER HAD IT SO EASY

It's riding the NEW shock-free Goodman Rope Belt Conveyor*

Another GOODMAN FIRST

Here's a belt conveyor that is more easily and quickly installed or extended than any other belt conveyor made. That's because the usual rigid structural framing and fixed idlers are completely eliminated. In their place, parallel wire ropes support flexible chain-linked idler rollers over which the belt travels. And, instead of the load being forced to conform to a fixed contour and position for a crash-bang ride . . . the belt conforms to the load for a shock-free, money-saving ride. Money-saving because belt and idlers will last longer.

But even this substantial saving is dwarfed by the dollars you'll save in time and labor when installing, extending, or relocating the conveyor. Never before has the handling of a belt conveyor been made so simple. For example, you can extend 150 ft. of ***Rope Belt*** *between* shifts. With the tail section advanced and a new length of belting spliced on, just place the wire ropes and tension them by turnbuckles at terminal roof or ground anchors. Then position the light, rugged tubular supporting stands. Allow a few minutes more for hanging idlers on ropes and placing conventional return belt idlers at supporting stands. Start the coal moving!

And as the coal flows by you, check these other ***Rope Belt*** features and benefits:

- Ropes eliminate shock from idlers and roller impact from belt
- No impact idlers needed at loading point
- Wide idler spacing because of load carrying ability
- Assured alignment of ropes
- Self-aligning rollers
- Quick and lasting belt alignment
- Prelubricated, precision idler bearings
- Ropes conform to uneven ground, can be suspended over gullies or roads
- Negligible spillage
- Fewer parts per belt set-up
- Low first cost
- Low labor costs
- Low maintenance

With all these features, it's easy to see how the Goodman ***Rope Belt*** Conveyor will quickly pay for itself—then, add to your mining profits. Write today for full details.

GOODMAN
MANUFACTURING COMPANY
Halsted Street and 48th Place, Chicago 9, Illinois

CUTTING MACHINES • CONVEYORS • LOADERS
SHUTTLE CARS • LOCOMOTIVES • CONTINUOUS MINERS
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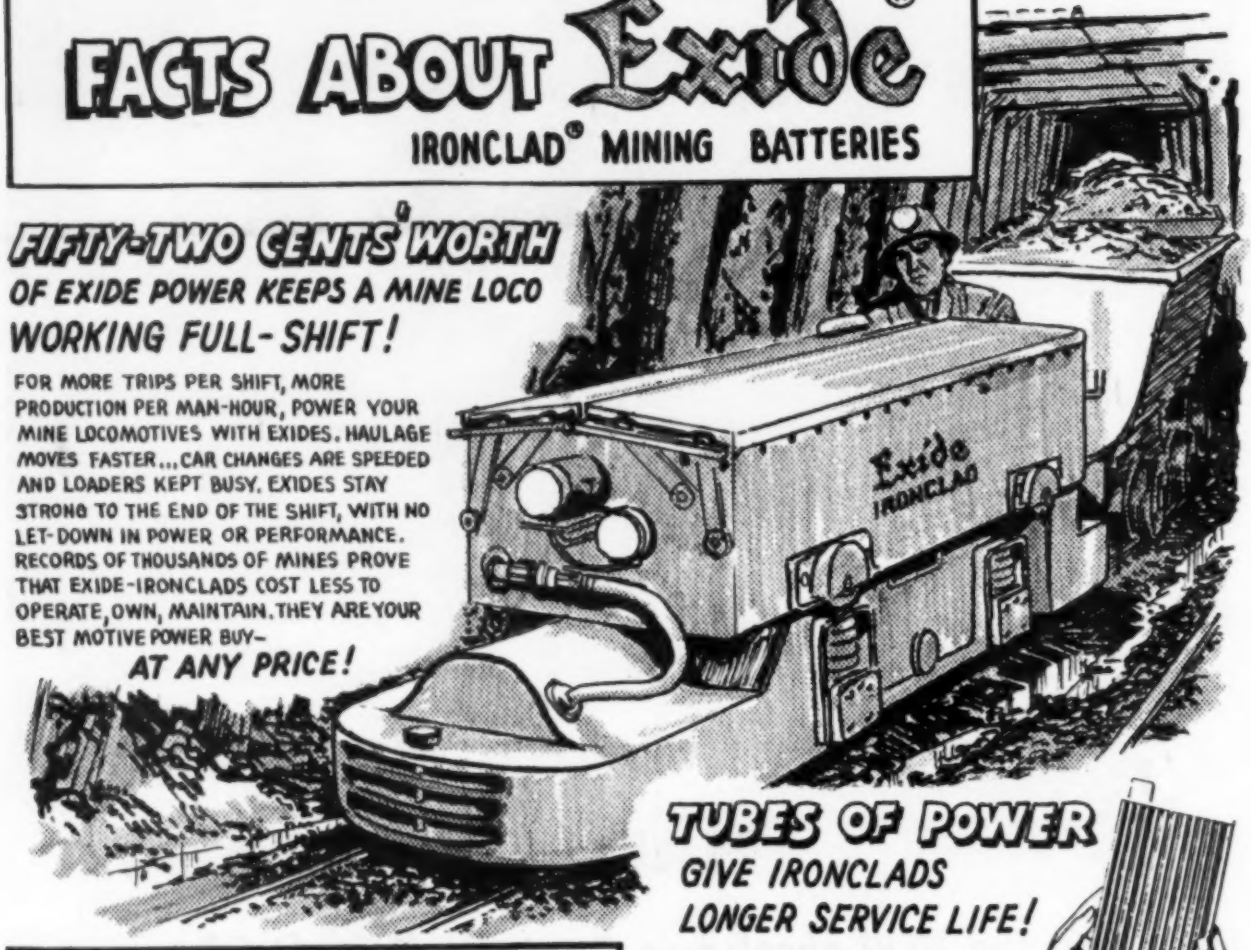
FACTS ABOUT Exide®

IRONCLAD® MINING BATTERIES



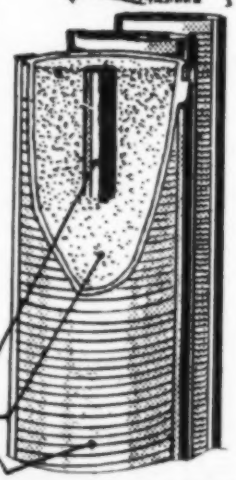
FIFTY-TWO CENTS' WORTH OF EXIDE POWER KEEPS A MINE LOCO WORKING FULL-SHIFT!

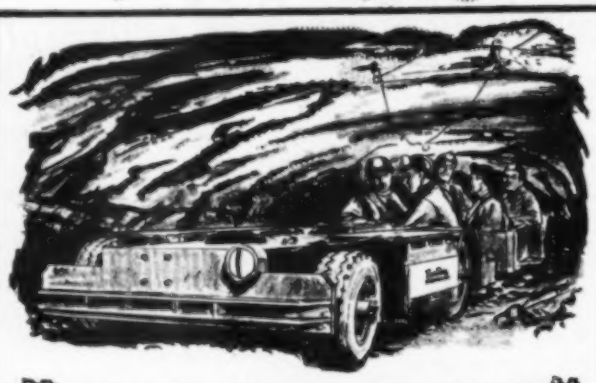
FOR MORE TRIPS PER SHIFT, MORE PRODUCTION PER MAN-HOUR, POWER YOUR MINE LOCOMOTIVES WITH EXIDES. HAULAGE MOVES FASTER... CAR CHANGES ARE SPEEDED AND LOADERS KEPT BUSY. EXIDES STAY STRONG TO THE END OF THE SHIFT, WITH NO LET-DOWN IN POWER OR PERFORMANCE. RECORDS OF THOUSANDS OF MINES PROVE THAT EXIDE-IRONCLADS COST LESS TO OPERATE, OWN, MAINTAIN. THEY ARE YOUR BEST MOTIVE POWER BUY—

AT ANY PRICE!

TUBES OF POWER GIVE IRONCLADS LONGER SERVICE LIFE!

FINELY SLOTTED TUBES INSIDE AN IRONCLAD KEEP THE ACTIVE MATERIAL IN FIRM CONTACT WITH THE CONDUCTING GRIDS OF THE POSITIVE PLATE. THUS, THE GRID IS PROTECTED... THE ACTIVE MATERIAL IS KEPT IN CONTACT WITH THE GRID LONGER... *THE BATTERY'S WORK LIFE IS LENGTHENED.* THE SLOTTED TUBES ALSO EXPOSE MORE ACTIVE MATERIAL TO THE ELECTROLYTE... *FOR GREATER POWER!* RESULT: THE IRONCLAD'S ABILITY TO DO A DEPENDABLE JOB FOR A LONGER PERIOD OF TIME.





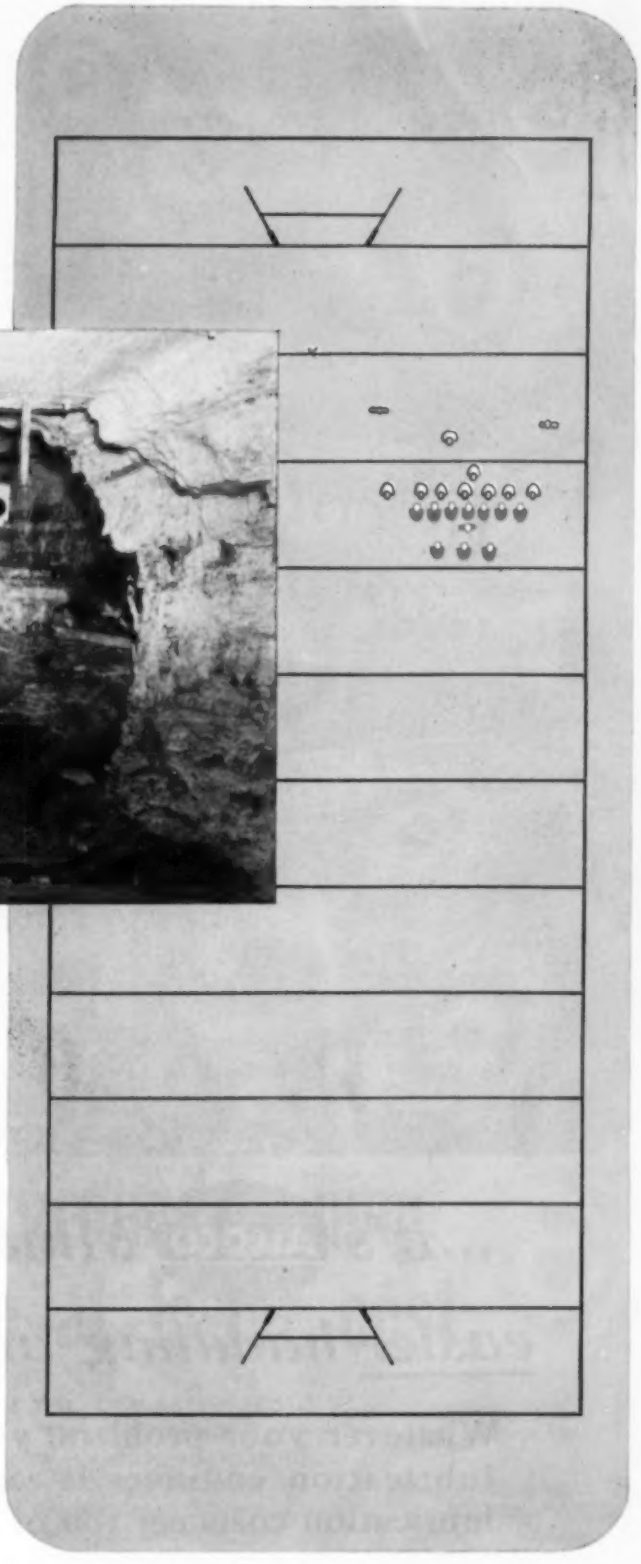
"UNDERGROUND TAXI" CUTS COSTS, BOOSTS PRODUCTION WITH EXIDE-IRONCLAD POWER!

THIS EXIDE-POWERED TRACTOR-TRAILER SPEEDS WORK CREWS, SUPPLIES AND EQUIPMENT TO PRODUCTION AREAS IN HALF THE TIME OF OTHER METHODS—WITH SAFETY, AND AT LOWEST COST. TO CUT PORTAL-TO-PORTAL TRAVEL TIME OR BOOST PRODUCTION, LET EXIDES HELP YOU. YOU'LL DO IT FASTER, BETTER, CHEAPER!

LET EXIDE HELP SOLVE YOUR MINING BATTERY PROBLEMS. ❶ CALL AN EXIDE SALES ENGINEER FOR FULL DETAILS. ❷ WRITE FOR FORM 1982, A MANUAL ON MAINTAINING MOTIVE POWER BATTERIES.

Exide INDUSTRIAL DIVISION, The Electric Storage Battery Company, Philadelphia 2, Pa.

Who's going where, when?



Who's going where, when, is just as important in mine haulage as it is in football. Incorrect signals in football are confusing. Wrong signals in mine haulage can be fatal. That's why signal equipment, and especially mine signal cable, must be reliable.

Simplex Mine Signal Cables help get accurate signals to the right place at the correct time. Properly understood signals are important, not only for safety's sake, but because they speed traffic, permitting reduced costs.

Simplex Mine Signal Cables are insulated with famous moisture-resistant Anhydrex insulation which is covered with a tough, flame-resistant neoprene jacket. These signal cables may be hung from the roof or entry walls, and can be buried directly in the gob.

Make sure everyone knows who's going where, when, by using dependable, accurate Simplex Mine Signal Cables. To investigate Simplex Mine Cables and Anhydrex insulation further, send to the address below for Catalog No. 1008.

Simplex MINE SIGNAL CABLE

SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge 39, Mass.

In cold weather stripping ...or deep mining operation

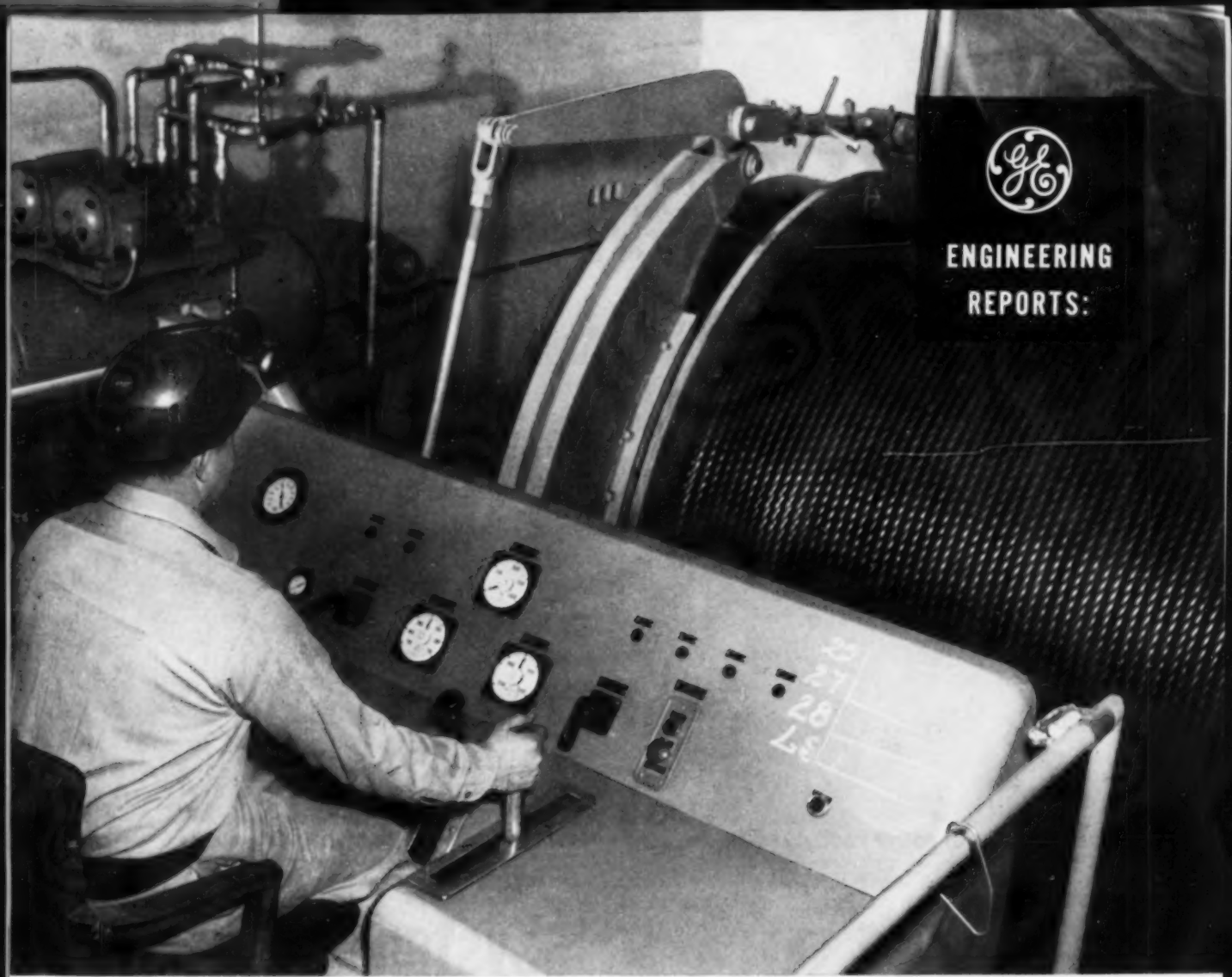
...it's AMOCO *Mine Lubricants for easier handling and full protection*

Whatever your problem, your nearest Amoco mine lubrication engineer is ready to help you cut your lubrication costs per ton of coal. Consult him *now*.

AMOCO LUBRICANTS

FOR MINE MACHINERY

AMERICAN OIL COMPANY



CUSTOM-BUILT G-E manual or automatic mine hoist drives are available in many types for heavy-duty hoisting.

G-E electrical systems and equipment help you . . .

Mechanize underground mining for more tonnage at lower cost

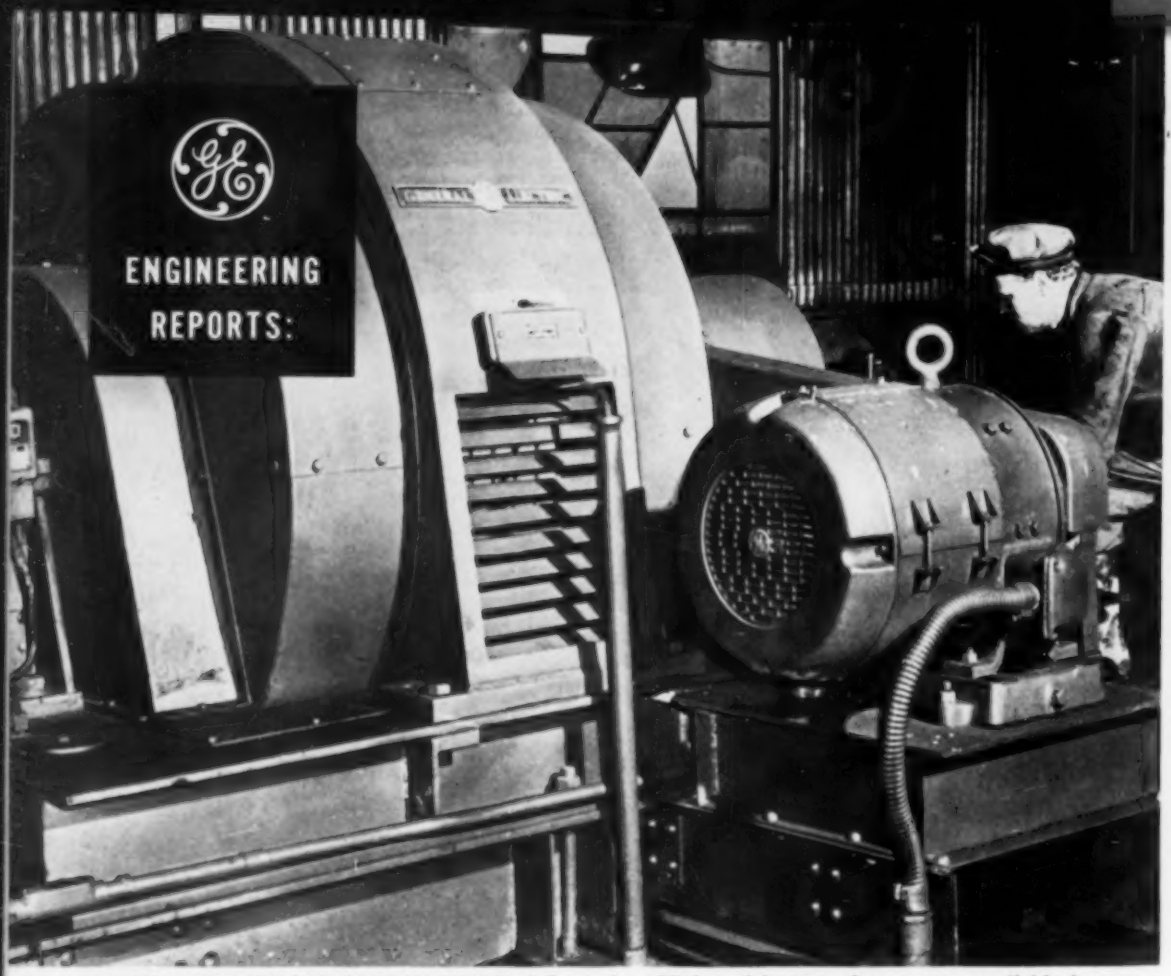
As market conditions change, underground mines must produce more, faster, and more efficiently, to improve their competitive position. Key to this objective is increased mechanization, with General Electric's help.

You benefit many ways when you specify G-E electrical systems and equipment. Advantages like these can play an important part in your mine mechanization program:

- **FACTORY-ASSEMBLED** G-E power-system equipment cuts installation time and cost, speeds new construction and start-up.
- **SPACE-SAVING** G-E electrical equipment adapts readily into existing systems, can be expanded easily, at low cost.
- **LOW-MAINTENANCE** G-E drives are designed to last longer, provide more horsepower in limited space, with maximum accessibility for servicing.

TURN PAGE FOR MORE PRODUCT INFORMATION

GENERAL ELECTRIC

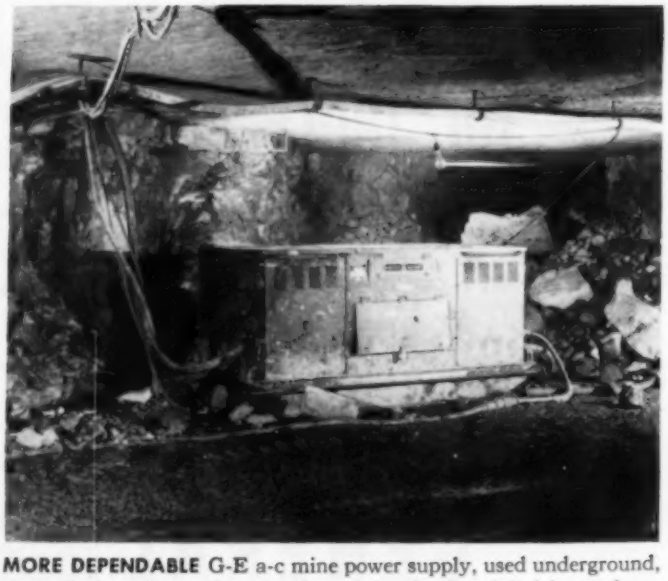


HIGH EFFICIENCY AND POWER FACTOR of General Electric synchronous conveyor or compressor motors cut electrical losses, and can reduce power rate.

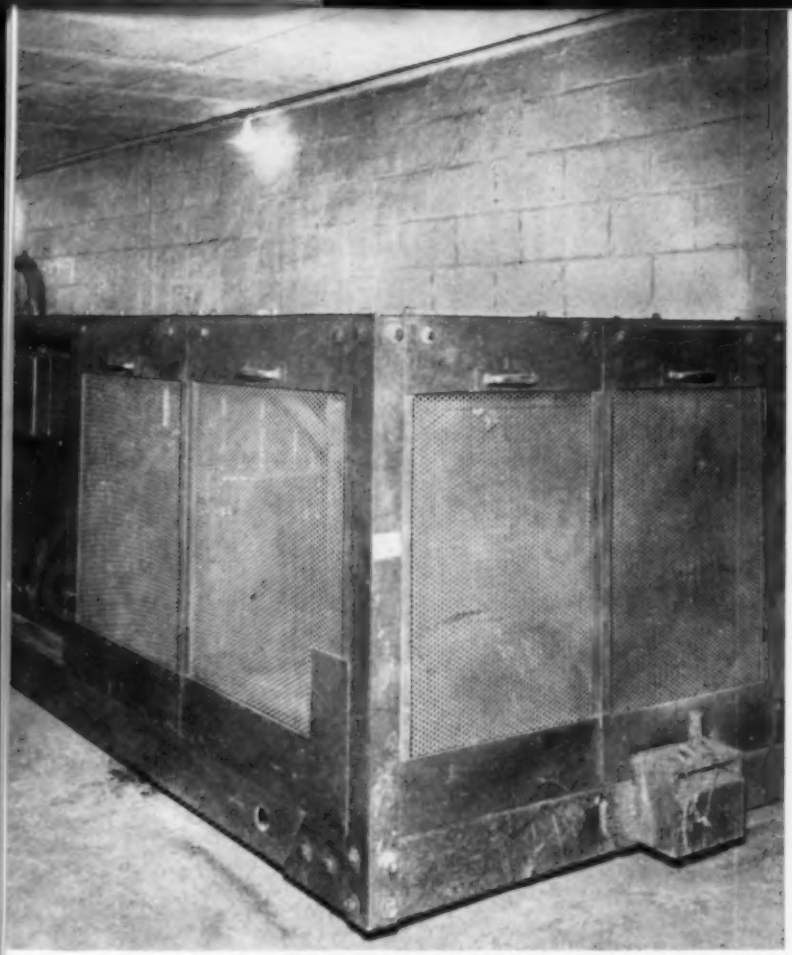
High and low speed types are available in many sizes, with just the required type starting, pull-in, and pull-out torque.

System-engineered raises efficiency of

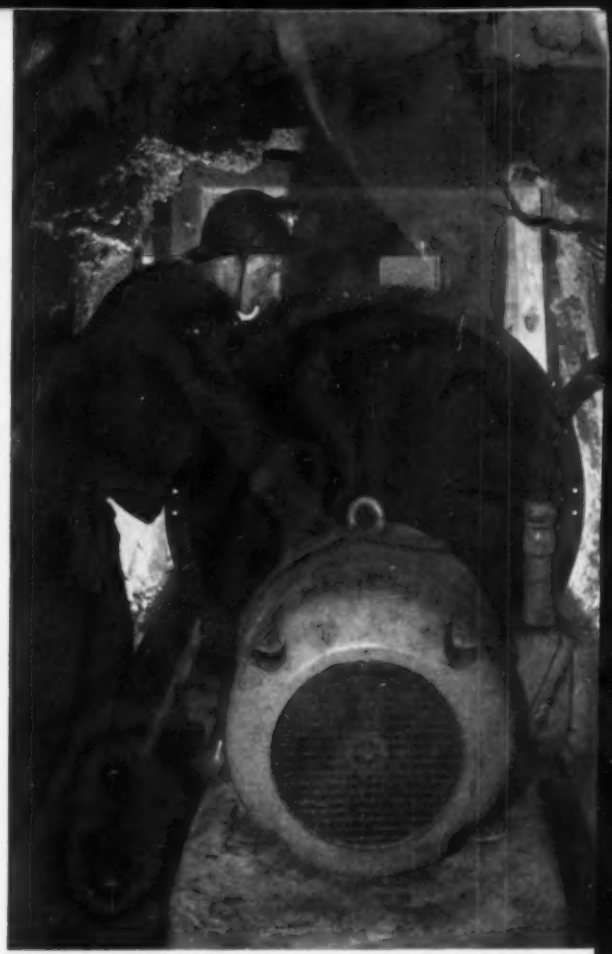
CONTINUITY OF PRODUCTION and flexibility of operation are promoted by G-E metal-clad switchgear. Factory-assembled, it is easily installed and maintained.



MORE DEPENDABLE G-E a-c mine power supply, used underground, steps down voltage close to the mining load, minimizing voltage drop, increases the efficiency of your mining machines.



LOW COST CONVERSION of power is obtained with portable G-E mining-type mercury-arc rectifiers. Move easily as face advances. Absence of major rotating parts reduces wear, shutdowns.



SPECIALLY DESIGNED for service reliability, rugged G-E totally enclosed fan-cooled Tri-Clad* motors are also available in design approved by Bureau of Mines.

G-E equipment underground mining

Modern General Electric equipment can give you the speed, flexibility and safety you need for more efficient underground mining. G.E. can also help in these ways:

Latest electrical techniques are employed by G-E application engineers, working closely with you or your consultants, to give you the most flexible and lowest-cost system for your mining needs.

Extensive developmental facilities are constantly used by G-E product engineers in providing new and improved products to help you increase mining output and efficiency.

From early plans through start-up, G.E. can co-ordinate selection, delivery and installation of all your electric equipment, saving you engineering time and construction costs. For more information, contact your nearest G-E Apparatus Sales office, or write General Electric Co., Schenectady 5, N. Y. 660-33

HIGH AVAILABILITY of G-E mine locomotives cuts costs. G.E. offers a variety of types which handle easily, efficiently, and help speed all haulage in underground mines.

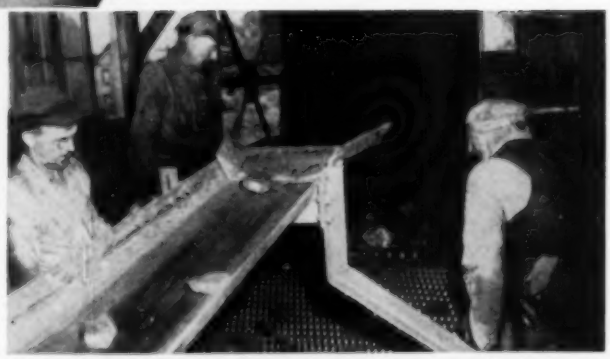
*Reg. trade-mark of General Electric Co.

Engineered Electrical Systems for Underground Mining

GENERAL ELECTRIC

Are hungry mine waters

YOU CAN DEPEND ON REPUBLIC FASTENERS above or below ground for fast, smooth assembly and lasting holding power. Track bolts, screw spikes, rivets, machine bolts are but a few of the more than 20,000 regular types and sizes of headed and threaded products made and stocked by Republic. Also, mine roof bolts for greater safety—"Nylok" nuts, where vibration is a problem. Order Republic fasteners from your industrial distributor.



A HIGH RESISTANCE TO ABRASION AND CORROSION assures longer service from lip screens made of Republic Enduro® Stainless Steel. This tough metal takes terrific bumps and scratches and comes back for more. It's perfect where high strength is required. And there's no coating to flake off. Republic, a pioneer in stainless steels, makes Enduro in many different analyses. If you have a possible application, contact your nearest Republic sales office.

eating you out of Pipelines?

REPUBLIC FLEXIBLE PLASTIC PIPE
can solve this problem. It's corrosion resistant

If you're tired of enormous bills for replacing corroded-out drainage lines, we have a practical suggestion.

Install Republic's New Flexible Plastic Pipe throughout your surface and underground mines. Made of chemically inert polyethylene, it cannot be damaged by acids, alkalies, metallic salts, or other corrosive wastes. It's also immune to the effects of electrolytic action, will not rot from the sun's ultra-violet rays.

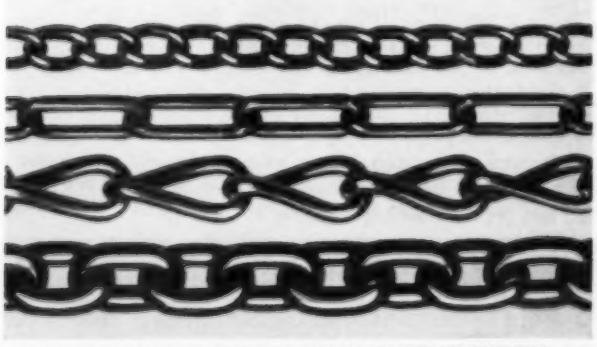
Easy to handle, Republic Flexible can be made up quickly by one man. Only tools needed are an ordinary knife or handsaw and a screwdriver for tightening the stainless steel clamps. Installation is 75% faster, much less expensive.

Its lightness makes Republic Flexible a pleasure to work with where space is limited. Available in long lengths, it can snake conveniently around corners. In low-coal mining, for example, one man can easily drag several hundred feet with no cumbersome joining to worry about. Its flexibility makes it ideal for strip operations where it can be moved from one location to another with ease. It follows terrain contours, can be dragged over sharp rocks with little danger of damage.

Republic Flexible Plastic Pipe is made in 9 sizes from ½″ to 6″. In coils it comes in sizes ½″ through 3″ in diameter. Straight lengths are furnished in 4″ and 6″. A complete line of insert-type fittings for any type of piping arrangement is also available—whether plastic to plastic, or plastic to steel. Sold by your local Republic jobber. For additional information, mail coupon.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products



ON MINING JOBS WHERE STRENGTH AND LONG LIFE ARE ESSENTIAL, you can count on Republic chain for greatest safety and dependability. Republic's Chain Division makes a complete line of welded and weldless chain for every mine requirement—every type of fitting, attachment and accessory. Strategic location of Republic plants and warehouses assures you of prompt delivery. Send coupon for additional information.

REPUBLIC STEEL

Republic Steel Corporation
3124 East 45th Street, Cleveland 27, Ohio

Please send me additional information on:

☐ Plastic Pipe ☐ Stainless Steels
☐ Bolts and Nuts ☐ Chain

Name_____ Title_____

Company_____

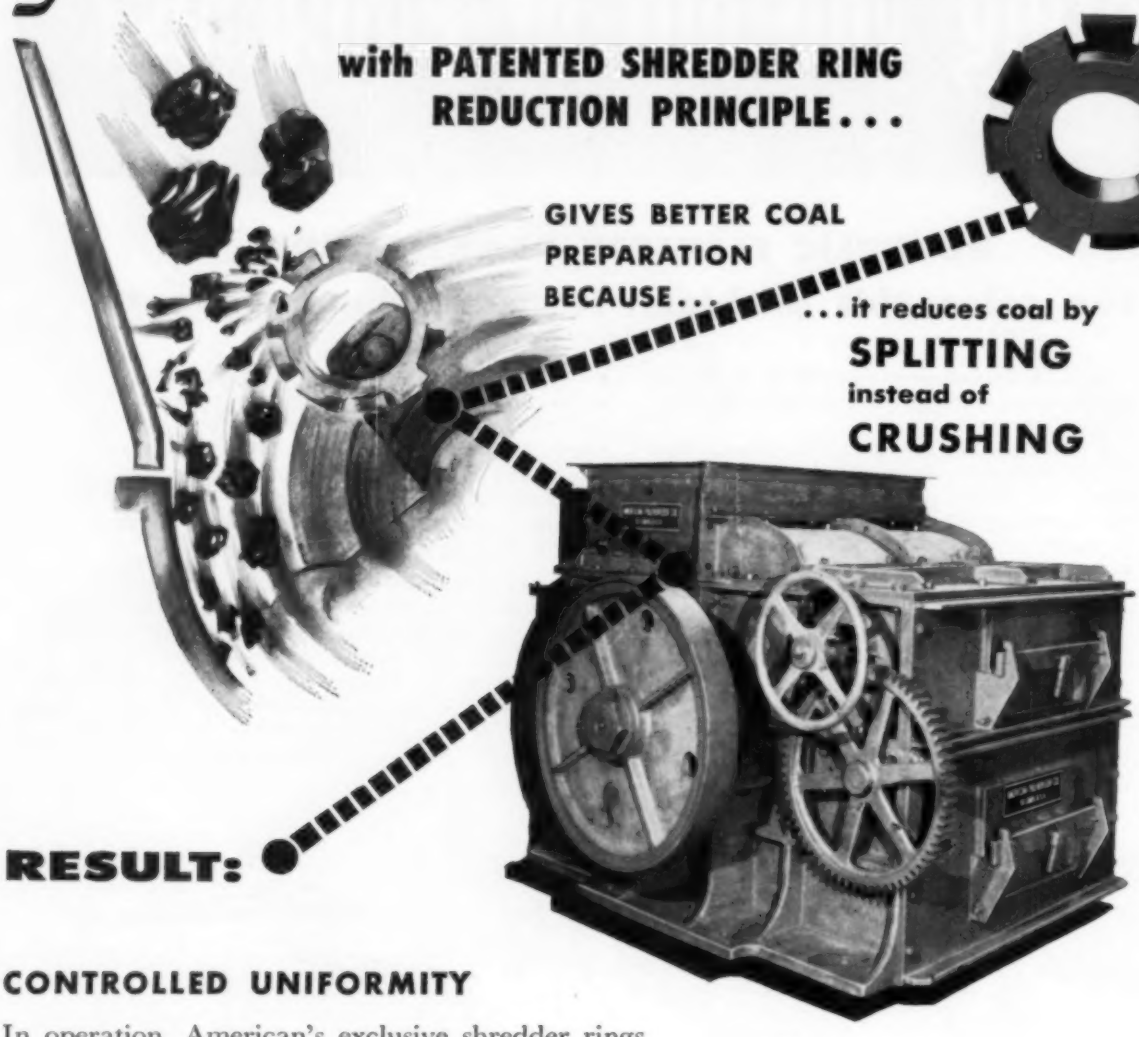
Address_____

City_____ Zone____ State_____

R-5-54

American Coal Crushers

with PATENTED SHREDDER RING REDUCTION PRINCIPLE...



GIVES BETTER COAL PREPARATION BECAUSE...

...it reduces coal by SPLITTING instead of CRUSHING

RESULT:

CONTROLLED UNIFORMITY

In operation, American's exclusive shredder rings swing outward, by centrifugal force, on their shafts —and reduce coal by the splitting action of 20 cutting edges on each shredder ring.

This action produces less fines, a more uniform product. The rings are reversible for double life.

and for LOW-COST COAL SAMPLE CRUSHING...

The American Sample Crusher, with its new adjustable sampling hopper, gives 5%, 10%, 15% or 20% of a sample . . . in one operation.

WANT MORE INFORMATION?

There are many *other* design and performance advantages in American Rolling Ring Coal Crushers—features that mean bigger tonnage figures, and lower maintenance (as proved repeatedly by coast-to-coast operations records). WRITE today for Bulletin AC, and get the crushing facts!

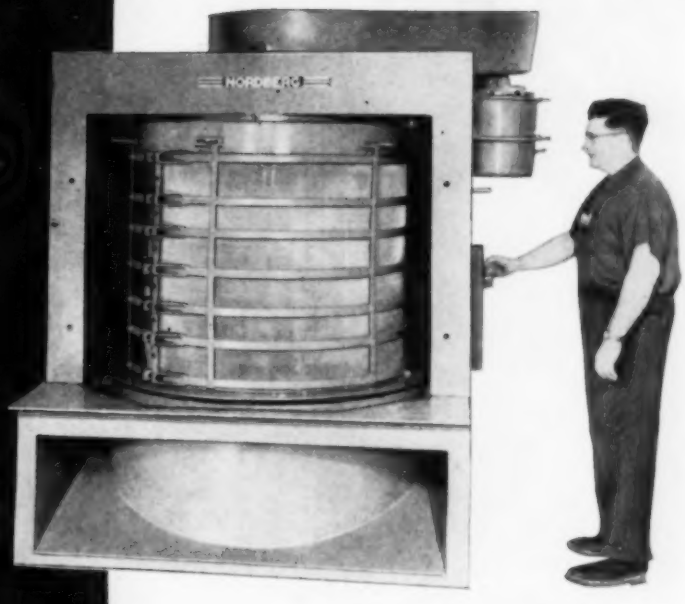
American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1119 MACKLIND AVE. • SAINT LOUIS 10, MO.

SYMONS V SCREEN

for Maximum Efficiency in Coal Dewatering



. . . THE ONLY SCREEN THAT DOES NOT DEPEND ON GRAVITY ALONE TO SIZE OR DEWATER

The SYMONS V-SCREEN combines centrifugal force with gravity to do a better screening job—make sharper separations—and give you a much dryer product with less degradation than other dewatering methods. It will reduce surface moisture by at least 50%, even on fine coals, and requires only 5 hp to operate under full load.

For example: In actual coal dewatering applications, with various feed sizes ranging from ⅛" x ¼" to ¼" x 0", the V-Screen is successfully reducing surface moisture of the feed as much as 65% . . . with product surface moisture content as low as 3.03%.

The capacity of the Symons V-Screen is over twice that of a conventional type vibrating screen, per square foot . . . with average tonnages ranging from 35 to 70 tph per screen. In addition, its new screening principle gives extremely long screen cloth life.

Mail the coupon for full details.

FEATURES:

- **HIGH CAPACITY**
- **EXTREMELY ACCURATE SIZING, EVEN IN THE FINER MESHES**
- **HIGHLY EFFICIENT DEWATERING**
- **FULLY ENCLOSED—DUSTLESS OPERATION**
- **EASY REPLACEMENT OF SCREEN CLOTH**
- **MINIMUM FLOOR SPACE REQUIRED**
- **LOW COST OPERATION**

Clip and mail the coupon for your copy of the new, informative Bulletin 243, which gives the story on Symons V-Screens.

NORDBERG MFG. CO. • Milwaukee, Wisconsin

NORDBERG MACHINERY

NORDBERG

SYMONS SCREENS NORDBERG

MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

NORDBERG MFG. CO.
Milwaukee, Wis. CA

Please send me a copy of the new Symons V-Screen Bulletin 243.

Name _____ Title _____

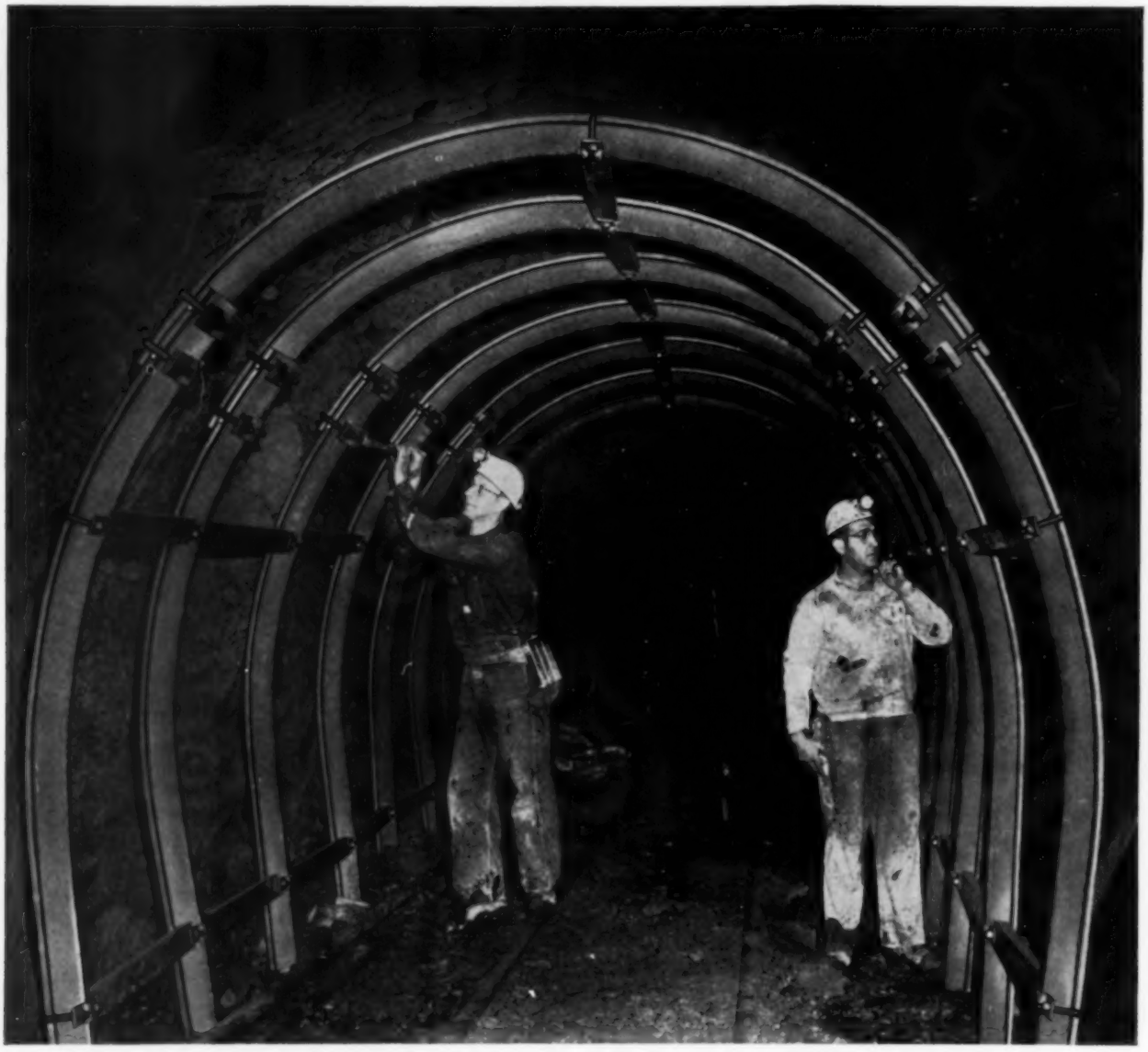
Company _____

Address _____

City _____ Zone _____ State _____

 S355

SYMONS . . . A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD



How to make your mine safer

Here is a mine tunnel that is on its way to becoming one of the safest in the business. Reason: roof and sidewalls are ribbed with the Yieldable Mine Arch, Bethlehem's latest contribution to safety underground.

As you can see, each arch is made up of segmental sections, nested one into the other and bolted together at points of overlap. Husky U-bolt clamps make the connections tight enough to support normal loads; but under unusually heavy pressures the joints will yield to relieve the load. Thus the structural integrity of the arch is maintained, as is the safety of persons in the area.

Horizontal struts and J-bolts tie each arch to its neighbor to provide lateral rigidity in the structure. As a finishing touch, timber lagging may be used if desired, or steel lagging can be furnished. Your own men will be able to install the Yieldable Arch without special skills or constant supervision.

Perhaps the most pleasant aspect of the Yieldable Arch is a matter of economics: its reasonable first cost should be more than returned in the first year of operation. Moreover, the arch can be taken down and re-used over and over again. One of our engineers will be glad to explain it in detail at your convenience.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

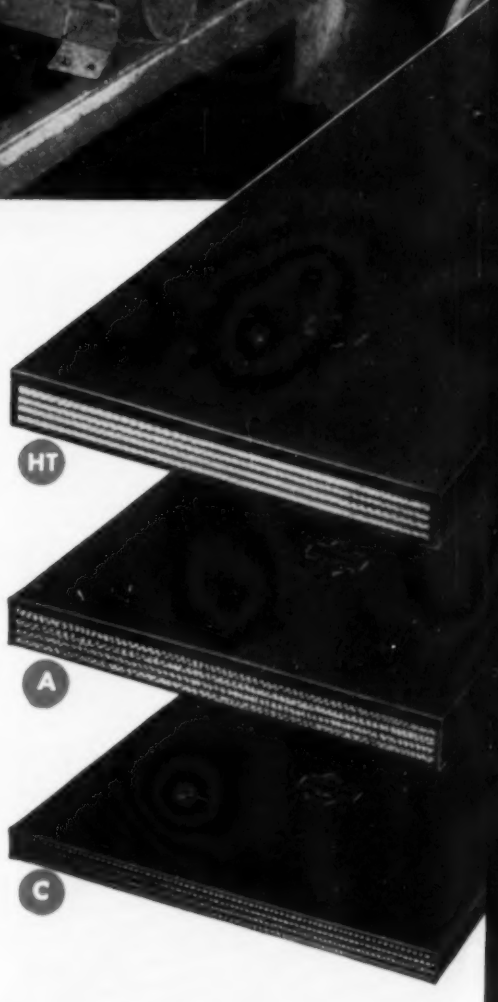
BETHLEHEM STEEL

BETHLEHEM STEEL

Thermoid Conveyor Belting cuts handling costs on rugged mining jobs

There's a Thermoid Conveyor Belt designed to lower your handling costs on every mining job. Here are three examples: HT —For extremely abrasive materials such as coal, granite, trap rock, flint rock, quartz ore; A —For slag, lime rock, crushed stone and other highly abrasive materials; C —For moderate abrasives such as sand, loam, soda, gravel.

Thermoid's exclusive impregnation process welds carcass and cover into an exceptionally strong, durable belt. Finest quality reinforcement and specially compounded rubber stocks assure long life . . . lower your handling costs per ton. Your Thermoid Distributor carries a complete line of Thermoid Conveyor Belting, Multi-V Belts and Hose to meet the most severe requirements of any mining operation. Call him or write direct for full information.



Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah

"We spent $900 on Stainless Steel and saved $30,000"

says **SHERWIN SORIN**
ATKINS COAL COMPANY
FRACKSVILLE, PA.

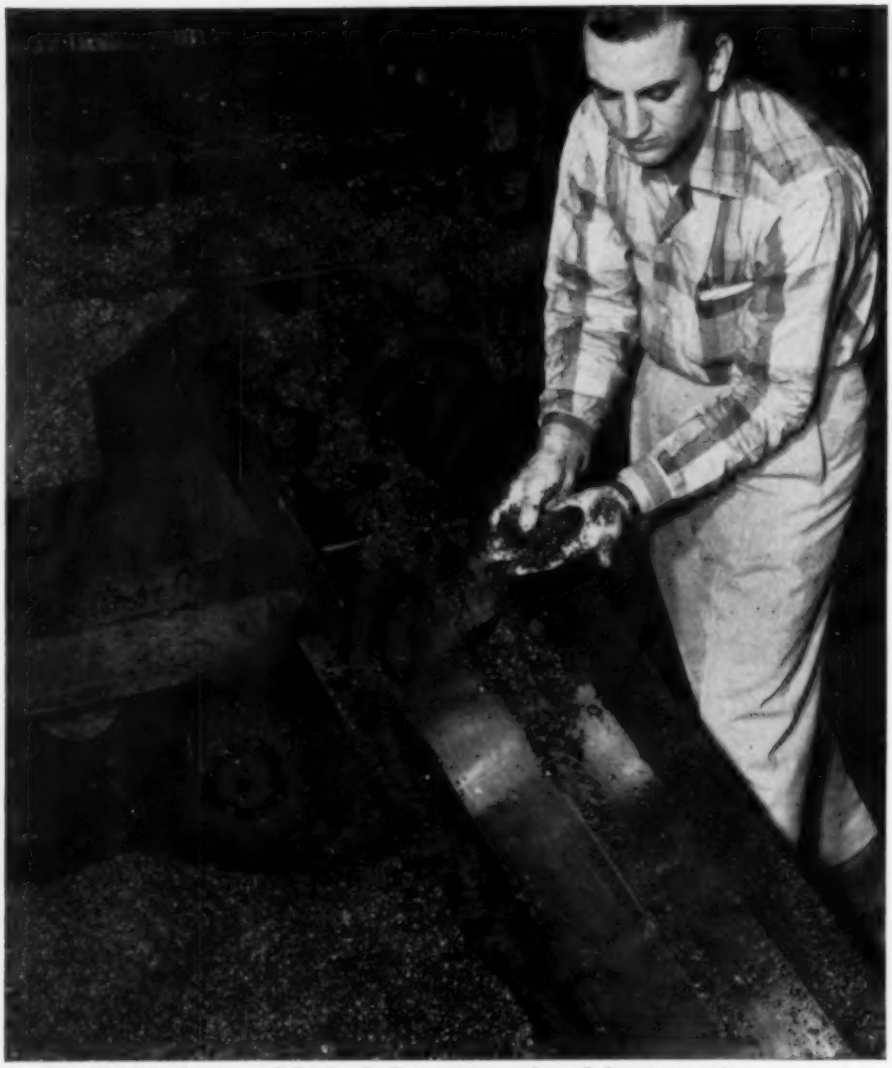
HERE'S THE STORY of Atkins Coal Company, in the words of Mr. Sherwin Sorin, Maintenance Manager:

"We spent $900 on Stainless Steel when we built our new coal breaker, and we have received a direct monetary saving of $30,000. We have done away with rust, erosion, corrosion and friction, reduced the pitch of the chutes, cut our water usage, improved efficiency by eliminating coal breakage, saved on construction, and have completely cancelled out our chute replacement problem.

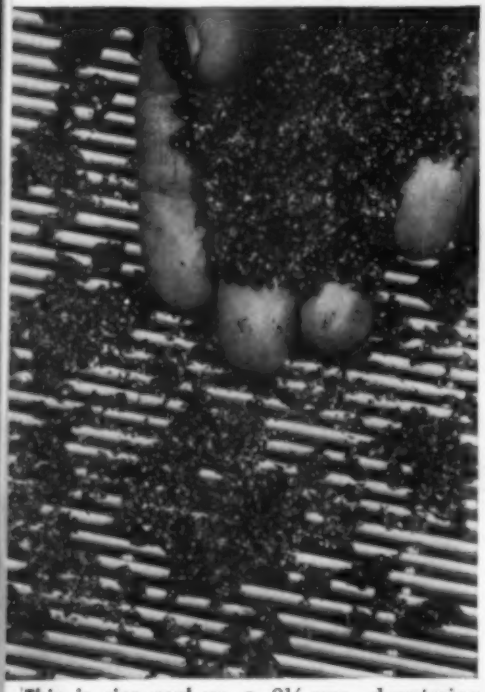
"We know of one case where carbon steel chutes were run alongside of Stainless Steel chutes in an actual durability test. *Seven* of the 10-gauge carbon steel chutes wore out and were replaced; but the 18-gauge Stainless Steel chutes were still in good condition.

"Stainless Steel chute liners, separation and dewatering screens are the greatest thing that ever happened to the coal cleaning business."

Buying new equipment? Start saving money *at the beginning* . . . specify service-tested USS Stainless Steel.



Here is #4 coal, the most difficult of all sizes to wash and dewater, as it comes down the Stainless Steel lined telegraphs. It was previously dewatered on Stainless Steel mesh shaker screens. The coal cleaning equipment was furnished by the Wilmot Engineering Company, Hazelton, Pa., who also designed the preparation plant.



This is rice coal on a 2½-mm. dewatering wedge bar. The smooth surface of Stainless Steel reduces friction, allowing coal to move faster with less breakage.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS STAINLESS STEEL

SHEETS · STRIP · PLATES · BARS · BILLETS — USS — PIPE · TUBES · WIRE · SPECIAL SECTIONS

5-1620

UNITED STATES STEEL

Announcing the appointment of National Mine Service Company

SALES AND SERVICE REPRESENTATIVES FOR FEMCO COMMUNICATION SYSTEMS FOR MINES

Femco Trolleyphones and Audiophone systems

The Femco Trolleyphone is one of the simplest, most useful mine communication systems ever devised.

All mine locomotives while moving or stationary can be in continuous contact with dispatcher and each other. The units operate on frequency modulated carrier current using the existing trolley wires for power and making a circuit between the trolley wire and the rail.

Femco Audiophone systems can be extended to communicate with any point not serviced by trolley wires: cleaning plants, hoist house, mine foreman's office, service shops, etc.

easy to use—easy to service

Servicing is vastly simplified with plug-in components. Entire sections plug in like a radio tube.

National Mine Maintenance

Your National Mine Representatives are always available to meet any of your regular service or emergency needs.

NATIONAL MINE SERVICE COMPANY
564 Alcoa Building Pittsburgh 19, Pa.

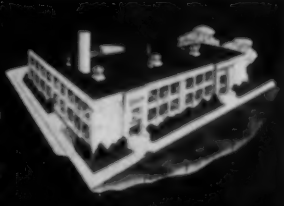
Years Ahead in Engineering

Years ahead of the field, Femco pioneered successful communication between mine locomotives and dispatcher.

Today—Femco is years ahead with the only proven compact trans-receiver unit with plug-in tubes, coils and components.

Sincere engineering effort continues to produce for you well-built equipment you can buy with complete confidence.

Femco Inc.
IRWIN, PENNSYLVANIA



Electronic Communication and Controls

TAPER-LOCK

A PATENTED PRODUCT OF DODGE

—OFF THE SHELF

NO REBORING!
NO KEYSEATING!
NO MACHINING!

Ready for the shaft, with no costly, time-consuming operations to make them fit. That's the big news about Dodge Taper-Lock Sprockets. Taper-Lock grips the shaft with the firmness of a shrunk-on fit, yet comes off easily. Bushings may be re-used. They come in sizes to meet most every application.

Taper-Lock Sprockets are available from Distributors' stocks in a complete range of B-type steel sprockets —½" to 2" pitch. Dodge quality Roller Chain is packaged in 10-foot lengths—also available in 50-foot and 100-foot reels. Save time—save money—keep production rolling—get Dodge Taper-Lock Sprockets and Roller Chain from your Dodge Distributor.

DODGE MANUFACTURING CORPORATION, 3000 Union St., Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor, for valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

THERE'S ONLY ONE TAPER-LOCK, THE BUSHING THAT MOUNTS FLUSH!

Standardize, economize with Taper-Lock, the bushing that is interchangeable in Dodge sprockets, sheaves, couplings and conveyor pulleys. *More than 2,000,000 in use!*

DODGE

of Mishawaka, Ind.

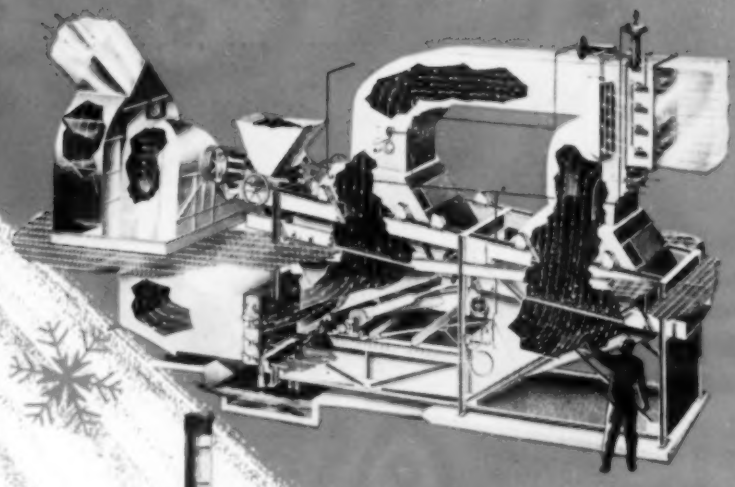
OLD MAN WINTER

can put the skids under your tonnage!

McNALLY VISSAC THERMAL DRYER

Dries sizes 2" to ½ mm. The induced draft fan draws the hot gases into ducts and down through the screen decks, automatically alternated each second between the two screen sections.

The McNally Vissac Thermal Dryer gives you five built-in advantages: 1) Uniform Drying of Large Tonnages to a Pre-determined Moisture Content; 2) Low Btu Consumption because of Mechanical Dewatering; 3) No Degradation, due to Smooth Screen Action; 4) Completely Automatic Control; 5) Very Low Operating Temperatures.



Harmattan Coal Preparation Plant, Fairview Collieries Corporation, Danville, Ill. Typical of those using the McNally Vissac.

INVESTIGATE NOW

The advantages of drying your coal

Mail this card! →

FIRST CLASS
PERMIT No. 93
(Sec. 34.9, P. L. & R.)
PITTSBURG, KANSAS

BUSINESS REPLY CARD

NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

4c-POSTAGE WILL BE PAID BY—

McNally Pittsburg Mfg. Corp.

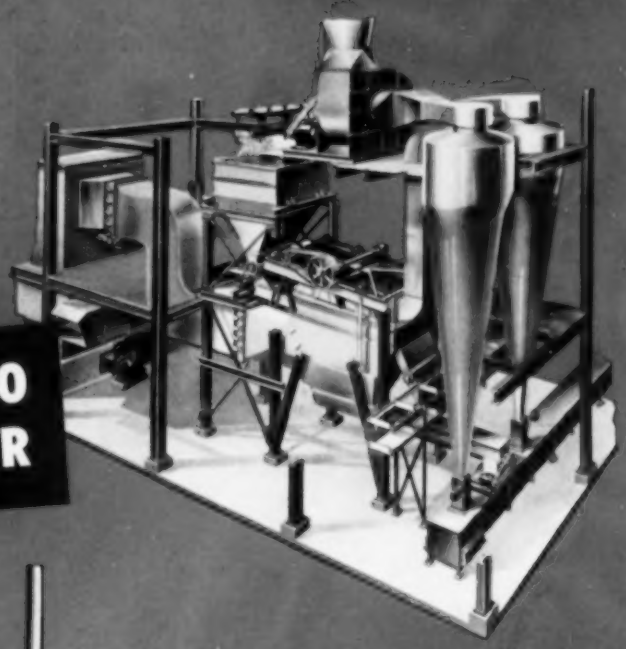
PITTSBURG, KANSAS

NOW is the time to

plan a dryer addition to your plant

The McNally Pulso is an up-draft type thermal dryer. It solves thermal drying's most difficult problem in the ½" to 0 range. Moisture is evaporated 100% without a drop of effluent. Surface moisture can be controlled to meet your customers' specifications. Dust is trapped 100% . . . no air pollution . . . no coal devaluation due to degradation.

Operating continuously under varying feed and atmospheric conditions, the McNally Pulso is usually equipped with automatic control system, although it may be operated manually if preferred.



McNALLY PULSO THERMAL DRYER

Truax-Traer Coal Company
Preparation Plant, Ceredo, W. Va.
Typical of those using the McNally Pulso.

STATE YOUR PROBLEM HERE OR ON YOUR LETTERHEAD

Send us your recommendations on McNally Heat Drying. We are operating on_____ seam. We would like to dry_____ x_____ coal at_____ tons per hour. Total moisture of washed coal to be dried is_____%. Inherent or seam moisture is_____%. We would like to have_____% total moisture in our dried product.

Our sieve analysis is:

x 1¼"	%	¼" x ⅛"	%
1¼" x ¾"	%	⅛" x 28 Mesh	%
¾" x ½"	%	28 Mesh x 48 Mesh	%
½" x ¼"	%	48 Mesh x 0	%

Name_____ Title_____

Company_____

City and State_____

( ) Have Sales Engineer call for further consultation.

C

McNally Pittsburg Manufacturing Corporation—Manufacturing Plants: Pittsburg, Kansas • Wellston, Ohio
Engineering and Sales Offices: Pittsburgh • Chicago • Rio de Janeiro • Pittsburg, Kansas • Wellston, Ohio

McNALLY PITTSBURG
MANUFACTURERS OF EQUIPMENT TO MAKE COAL A BETTER FUEL

NOW JUST ONE GREASE

does practically every grease job in your plant!

Improved

POCO HT Grease

is ideally suited for applications subject to extreme temperatures, moisture, speed and load. Here's why:

- It has a higher melting point than most special "high temperature greases."
- It can be pumped at temperatures as low as –20° F.
- It lubricates completely under conditions of moisture or water.
- It has higher oxidation stability for on the job.
- It provides extremely high protection against rust and corrosion.

Let your local Pure Oil representative tell you how improved POCO HT can cut lubrication costs for you. This may be the only grease you need in your entire plant. Why not call now and find out?

Now it's easier than ever to

"SIMPLIFY AND SAVE"

With improved POCO HT headlining Pure's Multi-Purpose lubricants, you can now save more than ever with Pure's "Simplify and Save" Plan. Find out how it will work in your plant. Write for full literature. The Pure Oil Co. 35 E. Wacker Drive, Chicago 1, Illinois.

Be sure with Pure

PURE

PURE MULTI-PURPOSE LUBRICANTS

Sales offices located in more than 500 cities in Pure's marketing area.

WIRE ROPE AT WORK — The Marigold Coal Mining Company, Jasper, Alabama, specializes in stripping operations. The scene above is typical of the daily work; it shows a dragline excavator stripping off some 30 ft of overburden. When the pay seam is reached, the coal is broken out and loaded into trucks by a 1¾-yd shovel.

Because of the heavy loads handled with every drag, the powerful excavator requires the staunchest wire ropes. Three sizes of Bethlehem Purple Strand, ranging in diameter from 1¾ to 2¼ in., are used on the big machine. In a service more rugged than most, these tough, strong ropes have consistently proved their ability to take punishment, and to answer every demand with plenty to spare.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:

MINING • QUARRYING • CONSTRUCTION • PETROLEUM • EXCAVATING • LOGGING • MANUFACTURING

Bit cost reduced 51 percent at Peters Creek Coal Company using Kennametal* D-3-inch Bits

High in the mountains of southern West Virginia, the Peters Creek Coal Company is maintaining a shift average of a brisk 21-ton per man mining out fingers of its Eagle Seam using Kennametal D-3-inch Bits.

In this seam, mining is normally limited to the 28-38 inches of coal sandwiched between two bone bands. This coal is exceedingly difficult to cut and drill, and face preparation requires major attention.

Kennametal Bits are used by the Peters Creek Coal Company as a result of drilling tests made several years ago as a part of a modernization program to increase production. For a two-month period, conventional steel and Kennametal D-3-inch Bits were tested. Accurate bit cost records proved that, during that period, the cost of conventional steel bits was $187.00. The cost of the Kennametal Bits was $92.50 . . . a saving of over 50 percent.

You learn to expect this type of performance when you use Kennametal. When next you buy, be sure to specify these quality, sintered carbide bits. They'll cost you less in the long run. Write to KENNAMETAL INC., Mining Tool Division, Bedford, Pennsylvania.

*Registered Trademark

The best measure of tool performance is bit cost per ton of coal

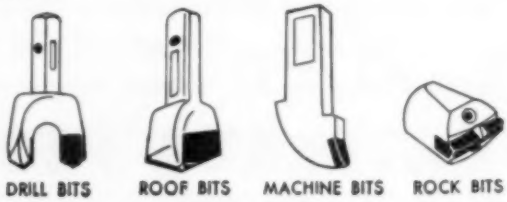
Peters Creek Coal Company, like other practical mine operators, has found that there is only one measure of mining tool performance . . . that is, *bit cost per ton.*

Why not let your Kennametal Mine Service Representative demonstrate Kennametal's ability to help you hold bit cost down to a minimum by showing you actual performance records? You will find not only that Kennametal Bits last longer, make drilling easier, improve rates of penetration, and increase coal production, but also that Kennametal Bits need reconditioning less often and cause little strain on equipment.

These records are due to one factor . . . Kennametal is the only sintered carbide producer that owns complete facilities for production of tungsten carbide tools, from raw materials to finished product . . . and so is able to maintain rigid quality control throughout every stage of production from mining select ores through complex phases of refining and manufacturing. The end result is less bit cost per ton of coal mined.

9539

INDUSTRY AND
KENNAMETAL
...Partners in Progress



FACING A TOUGH PROPOSITION?

you can beat it with *JALLOY*

Only a seasoned hunter with the right equipment can stand up to a charging rhino. And, likewise, only a special steel like JALLOY can withstand severe impact and abrasion . . . day after day. In comparison with mild steels as well as other abrasion-resistant steels, JALLOY gives outstanding results when heat-treated to your specifications.

This modern heat-treated plate brings savings in steel costs, maintenance, and repair, and also is easily welded. JALLOY is available in three grades, each of which is designed for specific applications.

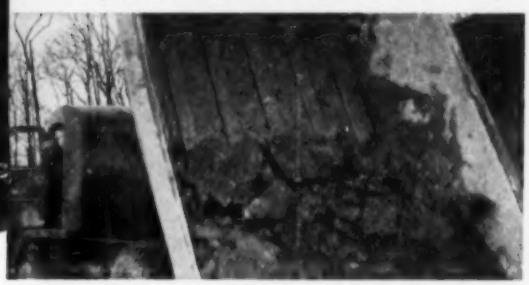
J&L STEEL

Complete data concerning CHEMICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*

Jalloy Plates outlast other steels by margins of 4 to 1

Jalloy lowers maintenance costs on ore and coal conveyors



Jalloy provides longer wear with less repair in truck bodies

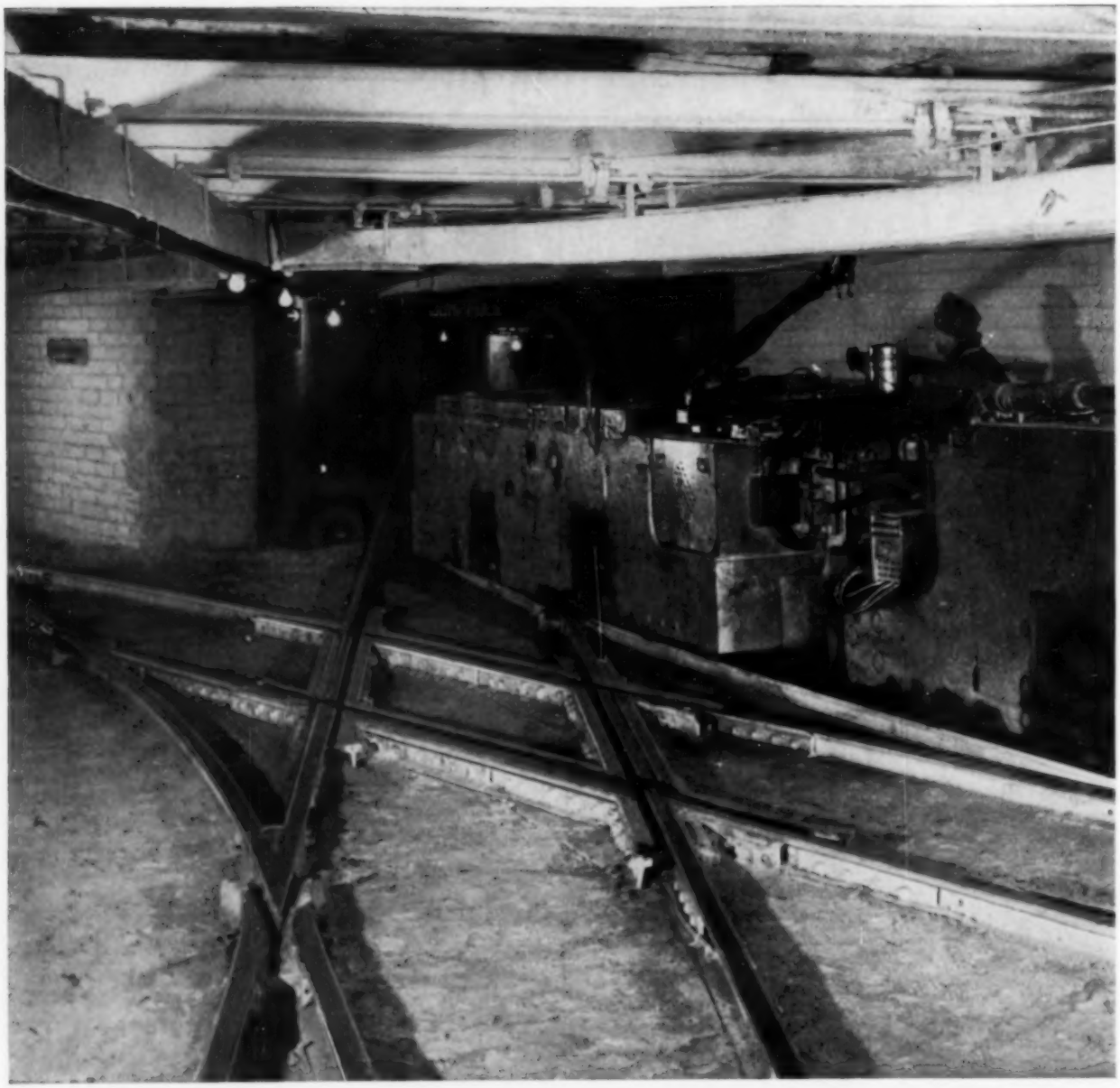
Jalloy Aprons in Tyrock screen last 3 times as long as other steels

Jalloy heat-treated steel plate beats wear due to impact and abrasion

Jones & Laughlin Steel Corporation
3 Gateway Center, Dept. 411, Pittsburgh 30, Pa.

☐ Please mail complete data concerning Jalloy.
☐ Please have your representative call.

Name_____
Title_____
Company_____
Address_____
City_____ Zone____ State_____



Smooth and fast

Here is the head-end of a trip gliding smoothly through a stretch of complicated trackage in Western Pennsylvania. Though the trip is long and the cars are loaded high, good speed can be maintained through these frogs and switches without risk to track or equipment.

Reason: this is heavy-duty Bethlehem track, planned and fabricated for just this kind of operation.

Bethlehem engineers, long-experienced in mine-haulage problems, did the designing. Other Bethlehem specialists rolled the rails, cast the frogs, and preassembled all components to be sure everything would fit to a T at the job-site. This layout has long since paid for itself in operating economies, and will go on serving and saving for years.

Many mines throughout the coal regions have found the answer to their haulage problems in the Bethlehem approach. Finding out Bethlehem's answer to your needs will cost you nothing and take only a little of your time. You can reach a Bethlehem engineer through our nearest office.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor:
Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

STANOLITH MP *Grease—a single grease—lubricates all equipment at Wright Mine*

THE BOONVILLE COLLIERIES Corporation's Wright Mine uses STANOLITH MP Grease to lubricate all grease-lubricated bearings. To Wright Mine management this is good business. Using a single but multi-purpose grease, the management finds, cuts grease inventories, reduces grease dispensing equipment and, in application, eliminates costly dispensing mistakes.

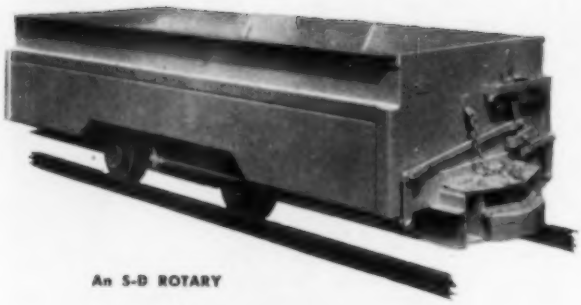
Roller, ball, plain, and needle bearings are lubricated by this one grease. This applies to all mine equipment—Marion stripper, loading shovel and dragline; 7 Euclid 45-ton coal haulers; two Caterpillar D8 Bulldozers and two International Harvester tractors.

Using STANOLITH MP Grease saves Wright Mine money. It can save you money, too. Find out. In the Midwest, call your nearby Standard Oil lubrication specialist. Or contact Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Marlin Carter, Wright Mine pit foreman (right), and Oscar Daussman, Standard Oil lubrication specialist, discuss equipment lubrication. Oscar is an old hand at providing technical service on lubrication problems. He has had more than 30 years' experience with Standard Oil, much of it working with customers on such lubrication jobs as this one at Wright Mine. Customers find this experience pays off *for them.*

STANDARD

STANDARD OIL COMPANY
(Indiana)



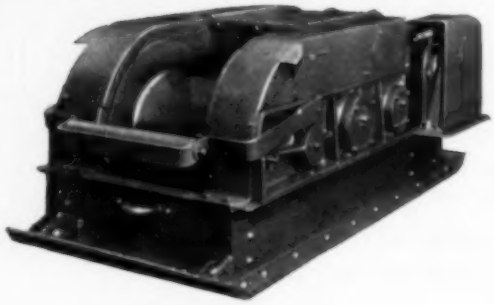
An S-D ROTARY

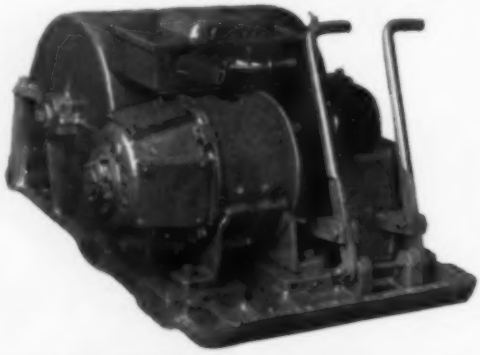
The new S-D BRAKEMAN CAR that eliminates skids and additional locomotives for braking trips.

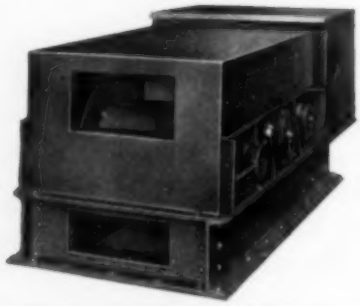
Sanford-Day ... Super

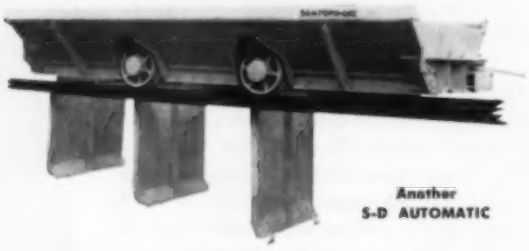
Headquarters for the BROWNIE LINE of Hoists — proved in scores of mines!

Our Brownie Line helps you select the right hoist to meet your requirements. It's the industry's most complete line—rigging hoists, room hoists, haulage hoists, car-spotting hoists, layer loading hoists—hoists for every haulage use. Be sure you obtain the right hoist to meet your requirements. Investigate the Brownie Line. Also investigate our Oil Spray Outfits, Gathering Pumps and Pump Accessories, Blowers, Brownie Rerailers and Derailers. BROWN-FAYRO DIVISION, Sanford-Day Iron Works, Telephone 3-4191, Write P. O. Box 1511, Knoxville, Tenn.

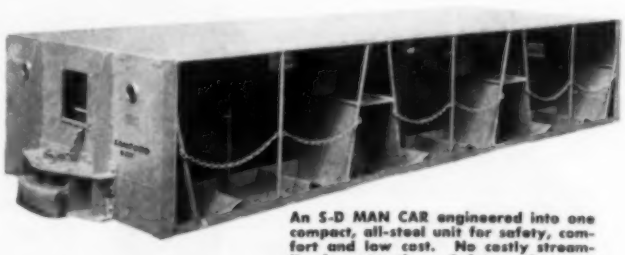




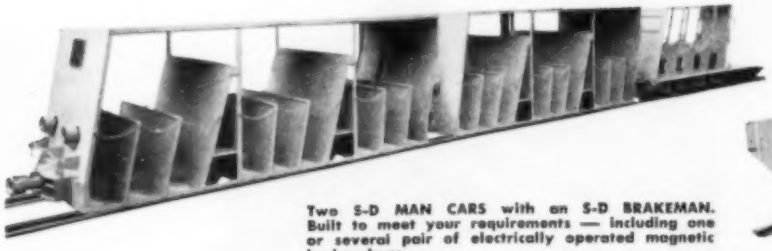




Another S-D AUTOMATIC

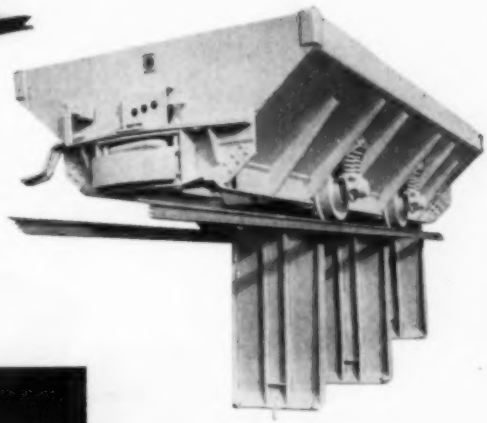


An S-D MAN CAR engineered into one compact, all-steel unit for safety, comfort and low cost. No costly streamlined construction. Safety at low cost was the important factor in this car — the best possible buy for safe and efficient personnel transportation.



Two S-D MAN CARS with an S-D BRAKEMAN. Built to meet your requirements — including one or several pair of electrically operated magnetic brake shoes.

A big capacity 4-wheel S-D AUTOMATIC is shown at right. Designed and built for extra years of service — ½" plate in the doors, for instance. Level full capacity 277 cu. ft. Surcharge capacity 338 cu. ft. Might be the car you need.



Market for mine cars

Below is another big capacity 4-wheel S-D AUTOMATIC. Negotiates 50 foot minimum radius curve when coupled. Note overlapping ends, permitting continuous belt loading without spillage between cars.

IS THERE SOMETHING special you need in mine cars—a feature to meet your particular requirements? You probably will find the answer in our plant. Down through more than 50 years of car building experience we have solved the major problems of mine haulage.

Regardless of the type car you need, we build it . . . cars so constructed to give you more years of service with the least maintenance. Shown here are but a few of scores of all types S-D Mine Cars regularly being built for coal mines. All are designed and constructed to give superior service for the lowest dollar. Whether you need one car or 101, don't hesitate to get one of our engineers into your mine—face-to-face with your problem. With this type of cooperation, plus our facilities and capacity to build any type mine car of any size, any haulage problem in your mine can be solved. *SANFORD-DAY IRON WORKS, Telephone 3-4191, P. O. Box 1511, Knoxville, Tenn.*

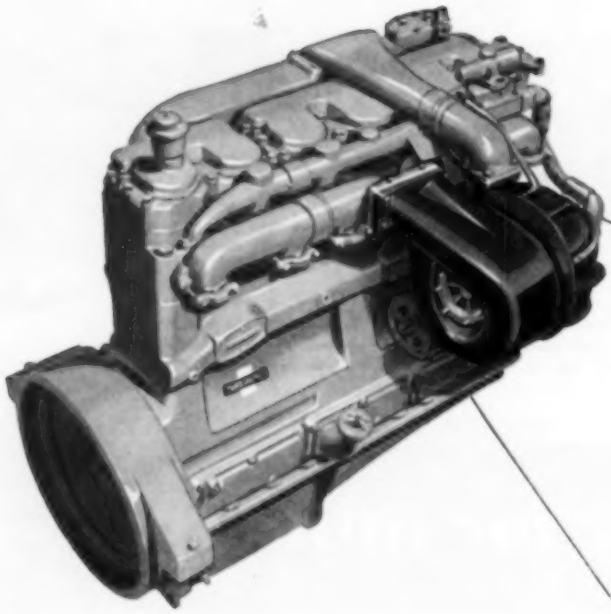
An S-D 8-WHEEL AUTOMATIC with four bottom dumping doors. Others have been designed and built with six doors. These S-D eight-wheelers also feature exclusive S-D "Twin Safety Latches" and "Safety Seal" against dust leakage.

Sanford-Day IRON WORKS

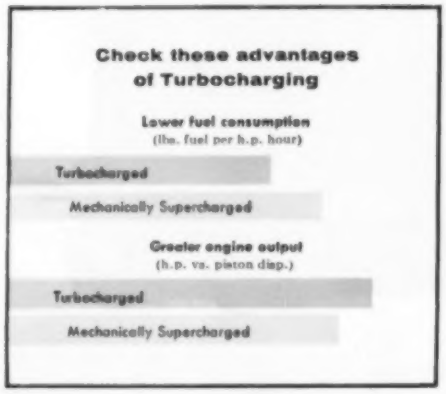
KNOXVILLE • TENNESSEE

AND BROWN-FAYRO DIVISION

MINE CARS, All Types - PRECISION WHEELS - "Brownie" HOISTS
CAR RETARDERS - SPOTTERS
PUMPS - OIL SPRAY SYSTEMS



Cummins Turbodiesels •



Five new Cummins Turbodiesels (175 . . . 250 . . . 262 . . . 300 . . . and 600 h.p.) now feature the sensational new development in Diesel engineering—exhaust gas turbocharging!

They give you more economy . . . more performance than naturally aspirated or mechanically supercharged engines. Exhaust gas energy normally wasted is harnessed to achieve a more perfect air-fuel mixture in the combustion chamber, without any parasitic load. (See diagram at right.)

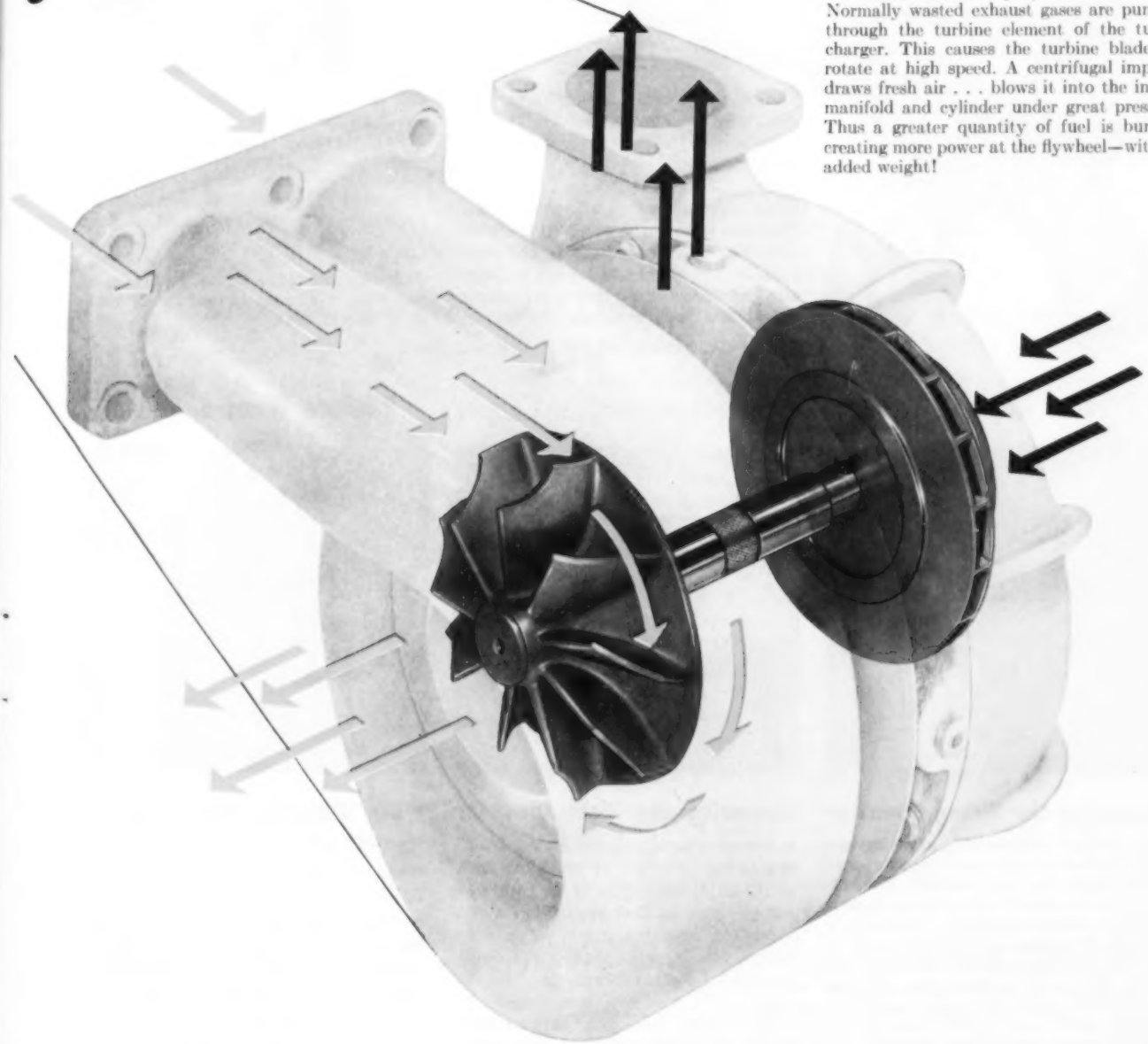
If you want drastically reduced fuel costs . . . longer engine life . . . lowest possible weight per horsepower . . . and maximum profits . . . get full details on Cummins Turbodiesels from your nearest Cummins Distributor.

Cummins Diesels are available in the equipment of over 40 leading manufacturers.

CUMMINS

Cummins Engine Company, Inc. • Columbus, Indiana

. . put waste heat to work!



flow of exhaust gases

flow of intake air

Cummins Turbocharging — how it works. Normally wasted exhaust gases are pumped through the turbine element of the turbocharger. This causes the turbine blades to rotate at high speed. A centrifugal impeller draws fresh air . . . blows it into the intake manifold and cylinder under great pressure. Thus a greater quantity of fuel is burned, creating more power at the flywheel—with no added weight!

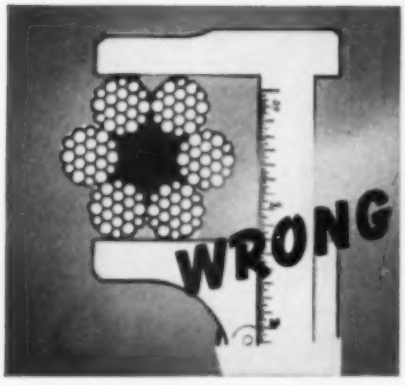
Tuffy tips on choosing the

Measure Groove Diameter Accurately

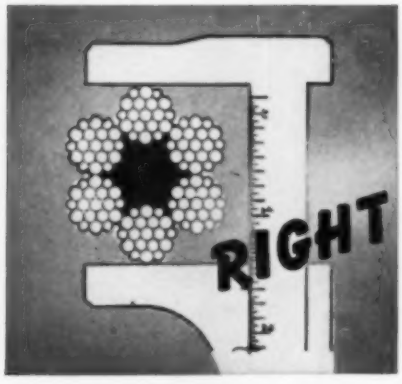
Shown above is the WRONG way to measure the groove diameter. The result—shorter life of the wire rope you buy. Note that only the sides of the rope will bear on the sheave. In a relatively short time this will squeeze the rope out of round and set up destructive friction and stresses on the rope strands and wires. New rope is oversize and diameter of grooves on sheaves and drums should be slightly larger.

Shown above is the *CORRECT* way to measure the groove diameter. It is a simple thing to do and will give the rope you buy a chance to deliver all the service it possibly can. Remember a wire rope is composed of many closely correlated working parts and sheave grooves which are too large or too small throw them out of alignment. Just like any other working part on a machine, wire rope cannot do its best if it is misfitted.

If Present Rope Is Correct Size, Measure with a Caliper



Measuring the Wrong Diameter is a common mistake that some buyers make when they order replacement rope. When the rope arrives, it turns out to be too small—even though a machinist's caliper was used to assure accuracy. It's an easy mistake to make, but it's just as easy to remember the *right* way and be sure you get the right size rope. Otherwise both the safety factor and service life of the rope will be reduced.



Measuring the Right Diameter is the simple step shown above. Measure so that a single strand is on each of the adjustable edges of the caliper—*not* two strands that measure as a flat side. The actual diameter of a wire rope is the same as that of the circle required to circumscribe it. The diameter of a wire rope is an important factor in determining the safe working load to be handled by your equipment.

Replace Worn Sheaves

When Replacing Rope, check for sheaves that have been badly worn. Sheaves that have grooves corrugated by the rope lay impression should be replaced immediately before installing new rope. Since rope creeps to a certain extent on sheaves these grooves can actually cut the strands as the rope runs over. This will greatly reduce service life of *any* wire rope.

right replacement **Rope**

Beware of Critical Tread Diameters

It is highly important to accurately measure the tread diameter of the smallest sheave or drum on any machine. Here's why. It is on this sheave or drum that the wire rope will get the greatest wear. Some constructions of wire rope will work on smaller tread diameters than others without lessening their service life. Engineers have determined the critical tread diameter for different constructions as shown in the table at the right. Also shown in the table is the minimum recommended tread diameter which is 50% larger than the critical tread diameter.

Example, the tread diameter of your smallest sheave is 24 inches. You know that a 1-inch rope is necessary. Referring to the table at the right you see that the 6 x 19 Warrington or Filler wire is suitable because the minimum tread diameter recommended for it is 24 times the diameter of the 1-inch rope. This gives you a margin of 50% over the critical diameter of 16 inches. If flexibility is a factor in the operation then you would choose the Filler wire type of rope with fiber core.

Construction of Rope	Critical Tread Diameter	Minimum Recommended Tread Diameter
6 x 7	28	42
18 x 7	24	36
6 x 19 Seale	20	30
6 x 19 Warrington or Filler Wire	16	24
6 x 31	15	22
8 x 19 Seale	14	21
6 x 37	12	18
8 x 19 Warrington or Filler Wire	12	18

To arrive at critical tread diameter and minimum recommended tread diameter multiply the numbers above by the rope diameter.

Use The "Know How" of *Wire Rope* Specialists

Stemming from many years of cooperation with users and machine builders mastering wire rope problems, is a family of special ropes for special purposes. Into each is incorporated the rope construction, the grade of steel and operating characteristics found to be best for the service for which each is intended.

When you specify one of the* Tuffy *Wire Ropes, you can say Tuffy and forget complicated specifications!

Tuffy Dozer Rope
Designed to take the punishment of small winch drums and small sheaves . . . the shock of blade manipulation under toughest going. In 150' reels for easy mounting on dozer.

Tuffy Dragline
Has the built-in extra stamina, flexibility and abrasive resistance needed for longer service in rugged mining work. Helps move more material per rope.

Tuffy Scraper Rope
Flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Plenty tough to fight off drum crushing. On easy-to-mount reels.

Tuffy Slings
9-part, machine-braided wire fabric construction is extra flexible, extra strong. Resists looping, kinking. Straightens without material damage.

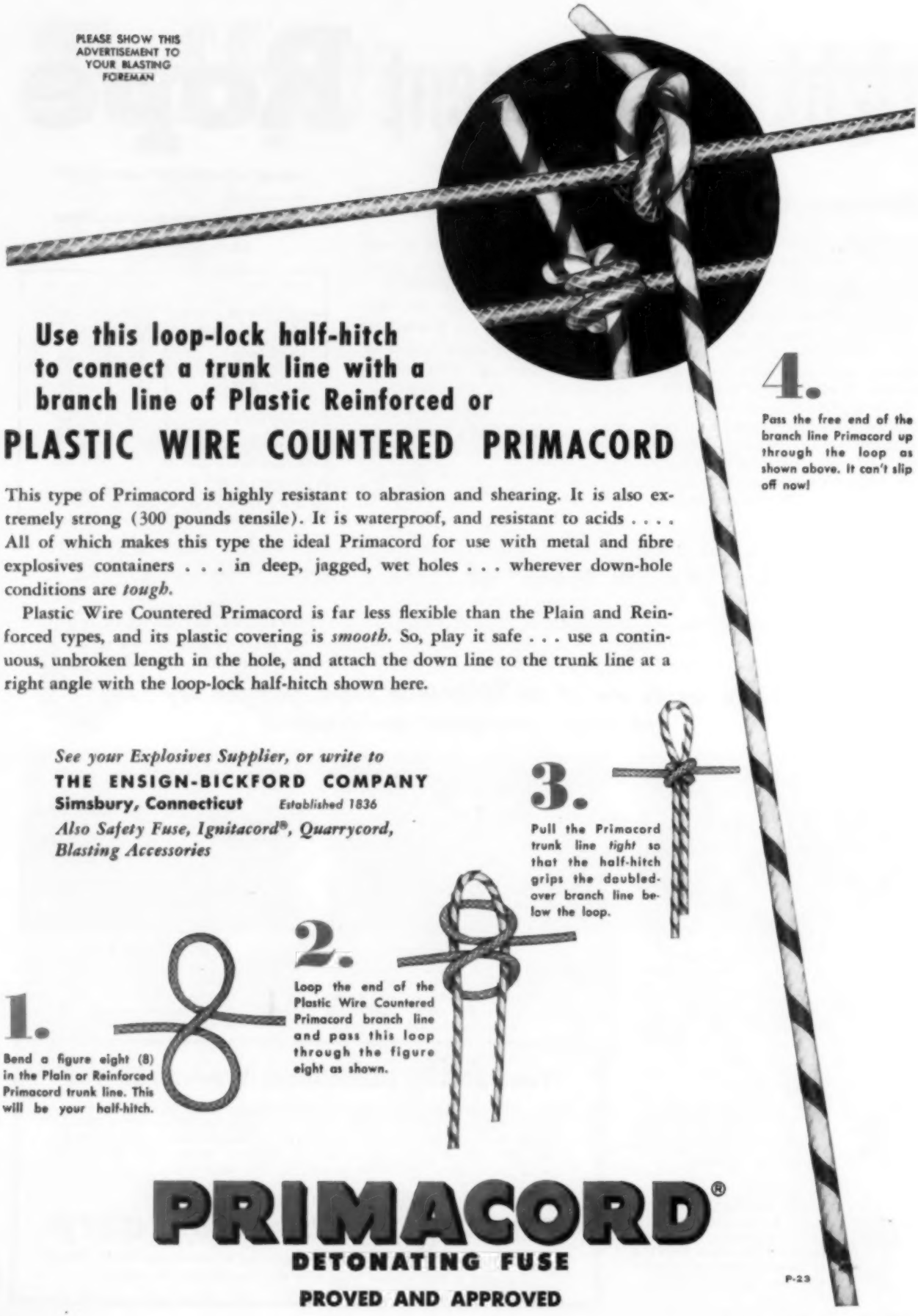
Tuffy Slusher Rope
Rigid, non-collapsing to eliminate drum crushing. Elastic and flexible to take shock loads and to better withstand abrasive wear in tough slusher loading.

Your Tuffy Distributor Works For You

He's the man who can help you find a fast answer to all your wire rope problems. He's also the man who often knows as much about some requirements of your equipment as the men who made it. He's the man who's eager to supply the kind of service that will hold your patronage. Feel free to call on him anytime.

union *Wire Rope* **corp.**
2130 Manchester Avenue Kansas City 26, Missouri
A-M *Specialists in High Carbon Wire, Wire Rope and Braided Wire Fabric*

PLEASE SHOW THIS ADVERTISEMENT TO YOUR BLASTING FOREMAN



Use this loop-lock half-hitch to connect a trunk line with a branch line of Plastic Reinforced or

PLASTIC WIRE COUNTERED PRIMACORD

This type of Primacord is highly resistant to abrasion and shearing. It is also extremely strong (300 pounds tensile). It is waterproof, and resistant to acids . . . . All of which makes this type the ideal Primacord for use with metal and fibre explosives containers . . . in deep, jagged, wet holes . . . wherever down-hole conditions are *tough.*

Plastic Wire Countered Primacord is far less flexible than the Plain and Reinforced types, and its plastic covering is *smooth.* So, play it safe . . . use a continuous, unbroken length in the hole, and attach the down line to the trunk line at a right angle with the loop-lock half-hitch shown here.

See your Explosives Supplier, or write to

THE ENSIGN-BICKFORD COMPANY
Simsbury, Connecticut *Established 1836*
Also Safety Fuse, Ignitacord®, Quarrycord, Blasting Accessories

1. Bend a figure eight (8) in the Plain or Reinforced Primacord trunk line. This will be your half-hitch.

2. Loop the end of the Plastic Wire Countered Primacord branch line and pass this loop through the figure eight as shown.

3. Pull the Primacord trunk line *tight* so that the half-hitch grips the doubled-over branch line below the loop.

4. Pass the free end of the branch line Primacord up through the loop as shown above. It can't slip off now!

PRIMACORD®
DETONATING FUSE
PROVED AND APPROVED

P-23

Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

Coal Age

OCTOBER, 1955

IVAN A. GIVEN, EDITOR

More Necessary

ONE THING FOR SURE, the new bituminous wage agreement will intensify the drive to take labor out of the mine price of coal. As for other effects, only the fact that production is definitely on the uptrend will prevent an immediate and appreciable increase in certain stresses and strains reflecting wage and welfare developments in recent years. But, as an example, the pressure for going nonunion—or staying that way—will still be there, and perhaps will be even greater, thus tending to widen the split between union and nonunion commercial operators. At the same time, it also will tend to widen the breach between captives and those commercial producers who contend that the captive influence is all that counts in making contracts. Happily, the upward trend in production makes open breaks unlikely in the immediate future. However, a due regard for maintaining maximum industry stability requires attention to alleviating these tensions to the maximum extent possible.

More immediate and more pressing from the standpoint of the commercial producers is what to do about prices. The immediate choice is complete absorption, complete pass-along or, very frequently, something in between. In the longer run, as always, relief can come only from reducing the labor content in the mine price to the absolute minimum. What that minimum is can be debated at length, but some place it at not over 20 to 25%, compared to today's average of around 50%, give or take a few points.

A minimum labor cost will not of itself automatically eliminate all labor problems and bring about maximum industry stability, but it will help mightily. Since the major ingredient in bedrock labor cost is machinery—and especially modern, high-capacity machinery requiring a minimum of manpower for operation and maintenance—coal must continue to bend its efforts toward attaining the maximum possible installation and use of machinery. In other words it is more necessary than ever to spend to acquire machinery, and then to exert every effort to capitalize on its possibilities to the fullest extent feasible. The problem today is little different from that of the past, and neither is the solution. The pressure is greater now, but so are the possible rewards for positive to-the-point action on the cost front, backed up by similar action on the merchandising front.

Even Arithmetic

"INDUSTRIAL TECHNOLOGY provides the extra food on the table, the extra mile on the speedometer, the extra dollar in the wallet. It is the extra bushel in the barn, the extra suit in the closet, the extra diploma at commencement time. It is the extra hours of leisure, the extra years of health and life, the extra measure of security. Our very security as a free people is dependent upon our capacity to produce and to employ the most modern industrial techniques."—*Henry B. du Pont*

The listing by Mr. du Pont might well have included a great many other products and services. "The extra ton of coal," however, is our particular concern, and "capacity to produce and to employ the most modern industrial techniques" now commands the highest premium in the history of coal mining. Key man is the operating supervisor, since he has the vital job of getting the most out of the modern facilities developed to up productive efficiency. Since his job is so vital, *Coal Age* considers that one of its major editorial functions is help in developing supervisory skill. In line with this conviction, we present this month two major features: "The Herman E. Knight Formula for Better Mine Management" and, in the Foremen's Forum, "The Arithmetic of Foremanship." We think they will repay thoughtful study.

TYPICAL ROOF at Concord is very thinly bedded, fossiliferous and friable.

"ROLLY" ROOF CONDITIONS at Short Creek mine. Note coal deposits in roof.

Investigating Bolted-Roof Falls

By Coal Mines Works
Tennessee Coal & Iron Div.
United States Steel Corp.
Fairfield, Ala.

ROOF-BOLTING is being referred to by many authorities as one of the greatest things that has happened to the coal-mining industry. It is being placed with rock dusting as an outstanding contribution in the never-ending search to make coal mines safer places in which to work.

During the last 6 yr much has been written and said about roof-bolting. There have been all kinds of ideas and theories advanced, there have been all kinds of bolts developed and tried, and there has been considerable capital invested in machines and tools used to install bolts. There have been claims that roof-bolting has made possible the extraction of coal from areas which heretofore were considered unminable. There have been claims, also, that roof-bolting has been instrumental in reducing accidents.

This praise of roof-bolting is justified. It has done a good job and should have a prominent place in the history of coal mining. The U. S. Bureau of Mines deserves much credit for sponsoring this new and radical method of controlling roof. The many privately-endowed mining operations are also entitled to show in the credit. The success of roof-bolting to date has been the result of a joint effort by everyone aimed at doing something constructive about reducing roof-fall accidents, the No. 1 coal hazard.

Along with its effect on accident prevention, roof-bolting has made possible increased production. Space, both vertical and lateral, has always been at a premium in coal mines. Roof bolts have provided additional areas for larger-capacity equipment to operate at increased efficiencies.

However, it should be understood by all that roof-bolting is not the final answer to our roof control problems. It is far from being perfect and it has its limits. Roof falls are still occurring —and in roof-bolted areas. There are still accidents from falls of bolted roof, and equipment is still being caught under falling roof rock.

This article is a report on the method of investigating falls in bolted roof areas in TCI coal mines. It is not a complete report because the final answer on how to prevent all falls has not been found. They are still occurring. To say how many falls have been prevented as a result of these investigations would be the same as saying how many accidents have been prevented by a particular safety program. It is unfortunate that this total cannot be accurately arrived at today.

The method of investigating bolted roof falls in TCI coal mines may or may not be the correct approach. It may not be adequate, and different techniques and considerable more technical research may be required. We have tried to work closely with the people underground and most of all we have tried to be practical.

The previous paragraph is included for a very definite purpose. It is hoped that by reviewing what we are doing and what we have found, others who are interested in improving roof control will think more about the problem. Perhaps with all of us working together, we can come up with a real solution.

TCI COAL MINE HISTORY

The Birmingham district of Alabama has very often been described as a geologist's paradise. It is one of the few places in the world where iron ore, fluxing stone and coking coal occur so close together in sufficient quantities to justify the construction of large steel mills. Mine tipples for all these three basic minerals are within sight of the blast furnaces.

The Tennessee Coal & Iron Div., United States Steel Corp., derives its name from a small coal-mining enterprise that started operations about

EACH MONTH a representative number of bolts are tested for correct torque (left photo). Bolts also are tested for proper installation (right photo). They are loaded with hydraulic jack until they either slip or break.

At TCI Coal Mines

1850 in the Cumberland Mountains of Tennessee. After experiencing the usual ups and downs of any company, the management of this small enterprise decided to expand, and soon undertook the production of coke and pig iron. In the 1880's, large mining resources and iron-making facilities were acquired in and near Birmingham, Ala. As a consequence, the company's operations came to be centered in the Birmingham area. By 1899, the then Tennessee Coal, Iron and R. R. Co. produced its first steel. The start of the twentieth century saw further expansion by TCI and, in 1907, the company became a part of the United States Steel Corp. In recent years it has been established as a major operating division of the corporation.

Today, to provide coke for its blast furnaces, TCI operates five coal mines—Hamilton, Docena, Edgewater, Short Creek and Concord, all of which are in the Warrior coal basin. These mines are located 4½ to 12½ mi by rail from the coke plant at the Fairfield steel works. Coal from these mines is used primarily in the manufacture of metallurgical coke.

THREE SEAMS MINED

The Warrior basin affords two seams for TCI's coal mining operations: the Mary Lee and the Pratt. Hamilton mine operates in the Mary Lee seam. Docena, Edgewater and short Creek mines are in the Pratt seam. Concord, the largest and newest mine, is in the American seam, a part of the Pratt group.

The usual room-and-pillar system is followed. Panel entries are turned off main entries at intervals of 2,000 to 2,600 ft. Room entries usually are turned off panel entries at 450-ft intervals. Entries have 4 to 8 openings. Room widths are from 20 to 30 ft, with pillars varying from 25 to 50 ft. Crosscuts are turned in all entries and rooms to leave a pillar not exceeding 70 ft in length.

Seam heights are as follows:

Hamilton: 93 in, including 33 in of slate partings

Docena: 35 in, including 2 in of slate partings

Edgewater: 86 in, including 18 in of slate partings; 60 in, including 11 in of slate partings

Short Creek: Full seam: 66 in, including 17 in of slate partings; above middleman rock, 35 in, including 3 in of slate partings

Concord: Full seam: 93 in, including 27 in of slate partings; above middleman rock, 67 in, including 12 in of slate partings

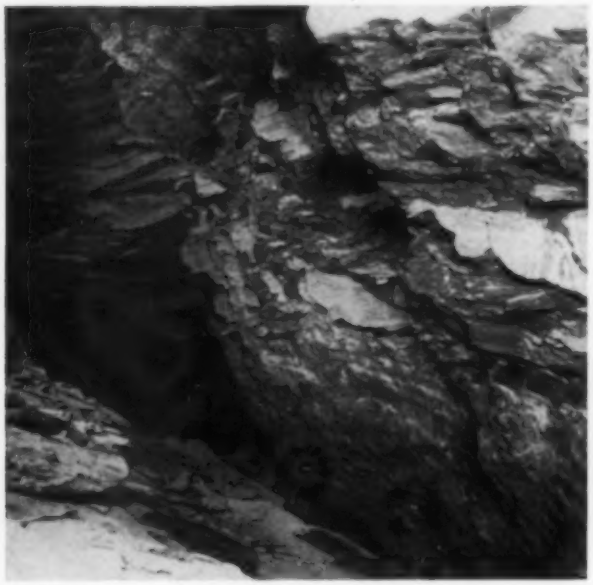
TYPES OF ROOF ROCK

Overburden varies from 125 to 750 ft. There are all types of roof rock, and it varies greatly from mine to mine and also in each of the mines.

At Hamilton, the roof is laminated shale with occasional sand stringers. A draw rock up to 12 in thick overlies the coal seam. It will fall if not supported. There are many pots immediately above the coal. This roof is generally good and lends itself very well to bolting. The major roof problem is to control the draw rock and pots.

Docena, Edgewater and Short Creek, have, in general, the same type of roof rock: a hard, sandy shale. In some areas there is a definite stratification of sand and shale. Sand stringers may vary from a fraction to several inches. Deposition is quite often wavy. There are many pots, rolls, horsebacks and angular slips, as well as crossbedding. Tying these unusual depositional features and unconformities to solid roof has presented the greatest problem at these three mines.

At Concord there is the greatest variety of roof. During the development of the mine, roof characteristics changed to the extent of being classed as three types. In the area of the dump, where mining operations were started, a thick sandstone was found to occur above the coal seam. It was considered self-supporting and capable of carrying a dead weight. As the mine expanded, it was found that in the northern and eastern sections the sandstone was separated from the coal seam by a rotten and very fossiliferous shale varying in thickness up to 20 ft or more, and of varying hardness.



ROOF FALL at Concord in which angular slip was found along rib. Note joints in upper section of photo.

OVERLAPPING ROLLS or horsebacks are very frequently found in Pratt-seam roof immediately above coal.

In the western and southeastern areas relatively hard, sandy shale occurs above the coal seam. Elsewhere, the roof structure varies from soft, friable shale with numerous fossils and carbonaceous partings to a moderately hard shale with sand stringers. Most bolts have their points of anchorage in shale, rather than in sandstone. The major problem at Concord is to get a good anchorage.

In all mines there is a system of vertical joints running parallel throughout the whole area. These joints, some of which are visible when the coal is mined, have played, we think, a very important part in causing many of our falls. In some falls there may only be one joint, while in others two or more have been found at varying intervals from a fraction of an inch to several feet. In a few instances, joints occur at an angle different than those commonly found, and where these two types of joints intersect, a fall usually occurs if wooden timbers are not installed in the affected area.

BOLTING HISTORY

Before 1948, roof in TCI coal mines was controlled in the usual and conventional manner. Wooden timbers were set on 4-ft centers lengthwise and crosswise of the working places. Carrying collars and cross collars were set where roof was bad, especially over roadways.

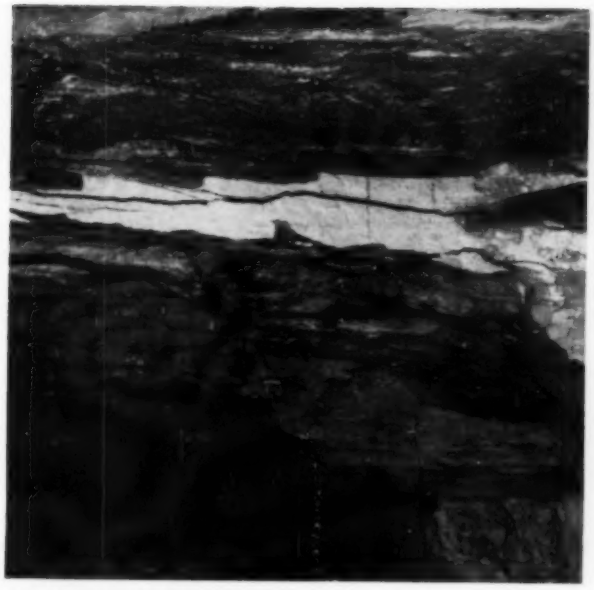
There was a definite need for roof-bolting. First, it was imperative that something be done to reduce roof-fall accidents. Second, to realize maximum benefit from the offtrack mobile equipment being purchased, more area had to be provided for its safe and unrestricted maneuvering.

Following a fatal accident at one of the mines in 1948, in which a shuttle car knocked a timber from under a carrying collar at an intersection, causing rock and collars to fall on the operator, it was decided to investigate roof-bolting, of which very little was known at that time. A party of four was assigned to study roof-bolting at a lead mine in Missouri and a coal mine in Illinois, and make recommendations as to its possible adoption in both the coal and iron ore mines of TCI. In selecting the individuals for this party, consideration was given to all phases of the operation because anything adopted had to provide adequate protection, had to be economically feasible, and had to fit into the mining cycle. A mine foreman, a maintenance foreman, an industrial engineer and a safety inspector made up the group. This party was favorably impressed by what it saw. A report was submitted which included a recommendation that roof-bolting be adopted for one mobile-equipment producing section at Concord mine as a pilot operation. If results were favorable its usage was to be expanded.

Needless to say, roof-bolting proved to be a step in the right direction. It is now used exclusively at Hamilton, Edgewater, Short Creek and Concord, where all coal is mined by off-track mobile equipment. Docena has a coal seam only 35 in high. Here, coal is loaded by hand onto shaker conveyors in all but two sections. In these, coal is loaded by a loading machine onto a shaker conveyor in one, and into shuttle cars in the other. Conventional wood timbers are used in all hand-loading sections. Roof bolts are used in the two mechanical sections, and in advancing haulageways where roof is brushed.

In the conventional mining cycle of roof control, cutting, blasting and loading, no special time allowances are made for roof-bolting—the roof-control phase of the cycle. To do otherwise would ultimately delay the loading phase and upset the cycle, or require the working of too many places or overtime.

In general, bolts are set on 4-ft centers, lengthwise and crosswise in all working places as they are advanced. Except for pillar recovery, bolts are used exclusively to support the roof. The open-end method of pillar recovery is followed and, in addition to bolts, a double row of timbers is used to protect workmen and serve as a breaker row. Bolts of the slit-and-wedge-type are used almost exclusively. Expansion-shell-type bolts recently have been installed in four low-vein mobile-equipment sections at Short Creek, and one low-vein mobile-equipment section at Docena. At the writing of this article, expansion-shell-type bolts are being installed in one section at Concord on an experimental basis. Length of slit-and-wedge bolts varies from 30 in to 8 ft, with 4 ft the predominate length. Length of shell-type bolts varies from 22 to 48 in.



SERIES OF JOINTS found in bolted-roof fall at Concord mine. These play an important role in falls.

Table I—Where and When Bolted Roof Fell at TCI

	Hamilton	Docena	Edgewater	Short Creek	Concord	Total
January	..	1	..	..	9	10
February	..	..	2	2	2	6
March	..	3	1	1	3	8
April	..	..	1	1	3	5
May	1	2	2	2	6	13
June	..	..	4	..	5	9
July	1	1	..	3	9	14
August	1	1	..	..	11	13
September	1	1	..	3	15	20
October	..	..	1	..	8	9
November	..	1	1	2	6	10
December	1	1	..	..	10	12
Total	5	11(1)	12(1)	14	87(14)	129

NOTE: Figures in parenthesis show cases where final collapse was prevented by installing wooden timbers.

Below are the number of roof bolts installed in each of the mines, and the roof area supported, as of March 1, 1955:

Mine	Number Bolts Installed	Roof Area Supported (Sq. Ft.)
Hamilton	306,884	4,144,814
Docena	239,274	3,545,689
Edgewater	497,778	12,597,018
Short Creek	625,689	13,166,778
Concord	1,919,433	29,262,494
Total	3,589,058	62,716,793

ROOF-FALL HISTORY

The first roof fall in a bolted area occurred at Concord, June 27, 1949, 13 mo after bolting was started at that mine. As of March 1, 1955, falls at all mines are as follows:

	Number Falls
Hamilton	5
Docena	11
Edgewater	12
Short Creek	14
Concord	87
Total	129

Before starting roof-bolting, numerous contacts were made with the U. S. Bureau of Mines in connection with minimum standards and bolting procedures. Immediately after the first fall in bolted roof, a committee was formed to carry out the two following main objectives:

1. Consult with local mine officials in the establishment of the most-effective and efficient roof-bolting plans and procedures applicable to the individual mines.

2. Investigate bolted roof falls for the purpose of making recommendations for their prevention.

As with the group which originally investigated the possibility of adopting roof bolts, all phases of the mining operation were given equal consideration in the selection of individuals to serve on this committee. The permanent members are the chief safety inspector, the assistant general superintendent, the assistant mining engineer, and an industrial engineer who is a graduate student in geology. Another member of the committee is the mine superintendent when a problem involving his individual mine is concerned.

When a fall occurs, the committee is advised and an investigation is made as soon as possible. Where possible, the investigation is made before the fallen rock is cleaned up or moved. Everyone who may have information relative to the fall is questioned. Pictures are made of most falls and then a formal written report of the investigation, with recommendations, is prepared.

INVESTIGATION RESULTS

It has been found that most falls have resulted from unusual and unpredictable geological conditions which weaken roof rock to the extent that it could not support itself, or because the roof material was such that a substantial anchorage could not be obtained. The committee has not found a definite instance of failure of the bolts themselves, or that they were being installed in a substandard manner.

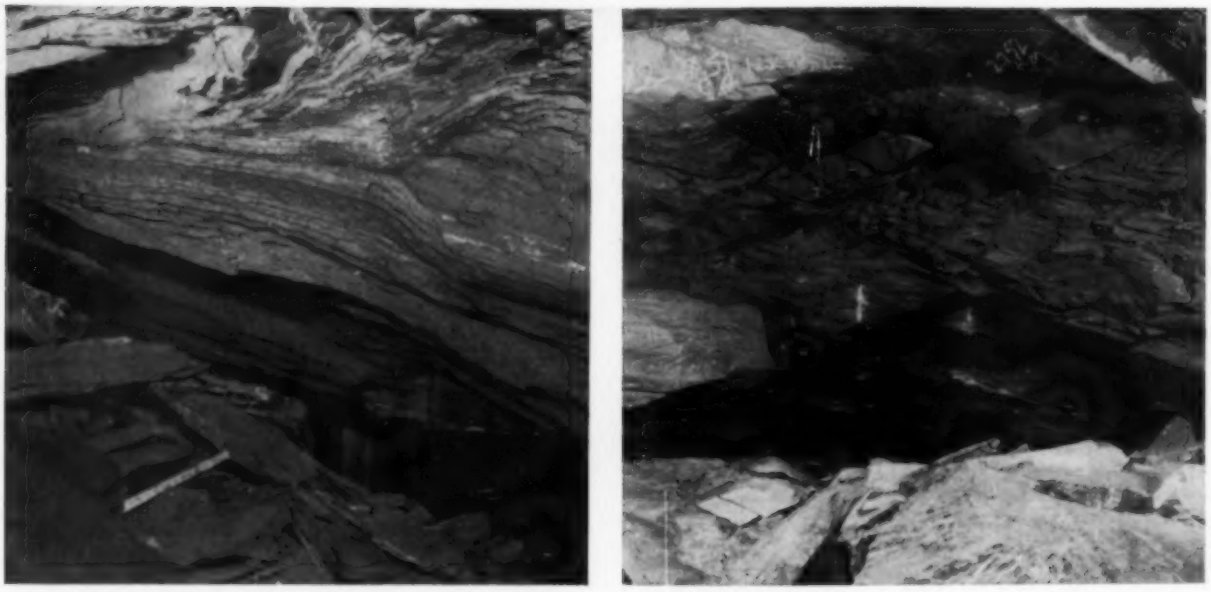
Some of the principal unusual and unpredictable geological conditions which caused falls are illustrated in accompanying photographs.

In the investigation of these falls, some very interesting facts have come to light. Table 1 lists the number of falls as they occurred by months of the year. It indicates that more falls occur during the spring and autumn seasons of the year, and especially in the month of September.

In 16 known instances, there was a warning and the fall was prevented by expeditious installation of timbers. These warnings are usually expressed by cutters or sagging roof, or by roof "working" in the same manner as before roof falls in pillar-recovery operations. Below is a table showing the elapsed time from the first moment a warning was heard or observed until the roof finally collapsed:

Elapsed Time From Initial Warning to Collapse of Roof	Number of Occurrences
1 — 5 min.	4
5 — 10 min.	6
10 — 20 min.	1
20 — 60 min.	1
1 — 2 hr.	3
2 — 5 hr.	1
5 — 10 hr.	2
10 — 24 hr.	10
More than 24 hr.	5
No witnesses	80

There have been very few instances in which someone has stood close by and watched bolted roof fall. In these, witnesses stated that the top "worked" and then began to sag slowly. Final collapse seems to take place after the roof has sagged about 2 to 3 ft. The "No Witnesses" classification repre-



EDGEWATER ROOF reveals roll or horseback, carbonaceous partings, angular slip, crossbedding and a joint (left photo). Cross fracturing and series of joints are exposed in fall at Hamilton mine (right photo).

sents those instances in which there had been no indication of a fall and it was found sometime later, usually by men returning to work after the place or mine had been idle for one or more shifts. A large number of falls have been found on Monday mornings after the mine had been idle over the week end. This would seem to indicate that had men been present quite a few falls could have been prevented by the installation of timbers.

There has been only one instance in which bolted roof suddenly collapsed and caught a man. This occurred fairly soon after starting roof bolting at one of the mines.

Most falls have been at intersections, 69 of which were four-way and 38 three-way. There have been 15 falls between intersections and six inby the last crosscut.

The period of time between installation of bolts and a roof fall has varied greatly, as shown in the following tabulation:

Period of Time After Bolts Were Installed in Fall Area	Number Falls
1 — 2 hr.	1
2 — 5 hr.	2
5 — 10 hr.	2
10 — 24 hr.	10
1 — 2 days	10
2 — 5 days	16
5 — 15 days	18
15 — 30 days	12
1 — 3 mo.	12
3 — 6 mo.	5
6 — 12 mo.	13
More than 1 yr.	28

ACTION RESULTING FROM INVESTIGATIONS

As a result of these investigations, considerable progress has been made in improving the roof-control situation. There have been investigations and studies by others at TCI in addition to the committee's investigations, and these have added considerable technical data and general information to everyone's knowledge of the problem.

Below are some of the developments and actions which have come about as a result of the many things learned from these investigations:

1. Many changes have been made in the original length of bolts. In some cases they have been lengthened, especially in places where roof has been found to be soft and friable, and also at some intersections. Where roof is found to be consistently substantial, lengths have been shortened. In general, the trend is toward shorter bolts.

2. Many variations of the original 4x4-ft spacings have been developed. In some good roof areas, the crosswise spacing has been increased to 6 ft. Another pattern, very adaptable to weak roof and intersections, where height of seam will not permit the use of longer bolts, is "star-bolting." This pattern involves an additional bolt in the center of the square formed by bolts set on 4-ft centers.

3. In some areas, every second bolt lengthwise and crosswise in an intersection is longer than bolts normally used in that area.

4. In extremely weak roof, combination roof-control plans have been developed using both bolts and conventional timbering. Some of these plans require timbers and/or cross collars in addition to bolts.

5. For all practical purposes, the practice of bolting channel irons to the roof has been discontinued.

6. Size of bearing plates (shin plasters) has been reduced from 8x8 to 6x6-in.

7. A good supply of conventional timbers is being maintained close to all working faces to be used for supplemental support upon the first indication of a fall.

8. Co-ordination of programs is effected for (1) testing bolts that have been installed, and (2) testing new types of bolts which seem to have merit.

9. Co-ordination has been established for the monthly testing of a representative number of bolts for the approved torque.

From the experience gained in investigating falls of bolted roof, much has been learned about the nature of the roof and, to some extent, about how to control it better. It is felt that by investigating falls and talking to the men at the face, there is a better understanding by everyone that even though roof-bolting is a wonderful thing, no one can go beyond its limitations. Everyone realizes also that there is much more work to be done.

Realizing that any improvement of methods and practices in our underground operations is dependent upon good roof control, we, at TCI, intend to continue to study roof action and investigate falls with the ultimate goal prediction and control of them.

The Coal Commentator

Lignite Enters the Lists

"The chemical industry has a new raw material from which a long list of new and known products may evolve. This new material is a low-temperature tar derived from the carbonization of lignite at the Aluminum Co. of America's plant near Rockdale, Texas."

Alcoa's issuance of this news release Sept. 27 reflects the fact that hydro power's grip on aluminum smelting has definitely been broken, with the result that several other aluminum producers have definite plans for using coal for power—both lignite and bituminous, with bituminous and the Ohio River Valley the front runners for the majority of the new projects. Since approximately 10 kwhr of electricity are required to produce a pound of aluminum, the total of the projected new plants to be based on coal adds up to a really significant new tonnage.

A byproduct—and no pun is intended—is the possibility of developing a new outlet in the chemical industry for products derived from the low-temperature tar which results from the drying and carbonizing process used to prepare lignite for the power plant at Rockdale. Development of markets for these products will solidify coal's future in still another direction. The list of companies participating in the research and utilization program includes the bluest of the blue chips in the chemical field, and indicates that results are definitely in the offing.

Eight Years After

The coal industry of Great Britain was nationalized Jan. 1, 1947. In May, 1947, *Coal*, a magazine sponsored by the National Coal Board, went on sale at the mines. In September, 1955, *Coal* published its 100th issue and took the occasion to review developments in the first 8 yr.

The review clearly indicates that Great Britain has earned "A for effort" on the technical and production side, and in research into coal use. Productionwise, 194 major schemes" have been adopted since the take-over, and £103,000,000 already has been spent on them, with a lot more to come. Face work has been marked by development of several new loading and mining and loading machines. NOTE: The Coal Board's top mechanization engineer will review these in a special article scheduled for early use in *Coal Age*.

Less happy, however, is the picture on the labor side. The old-time British miner, who still dominates the working force, has dragged his feet consistently and still is, and the British government and public have not shown too much desire to come to grips with this attitude. This is the major reason why production is still short and Britain must import significant tonnages of coal, while a growing defeatist attitude in public and governmental circles is evidenced by the avidity with the idea of developing the atom or oil as additional power sources is being endorsed.

Perhaps nationalization will yet prove the salvation of the British coal industry. However, the record of 8 yr indicates that this still is no more than a pious hope.

CONCLUSION: Maybe there's still a lot to be said for good old-fashioned private enterprise.

Why They Slip

Dieselization of the railroads, among other things, has aggravated the problem of locomotive wheel slip. This led the General Electric Co., as noted in the September, 1955, issue of the *General Electric Review*, to embark on a research program designed to uncover the exact cause of wheel slip. Water on a clean rail isn't it. But water and oil is it. In fact, even if oil is present on the side of the rail, moisture from rain, dew or merely high humidity will reach out and pull the oil over the running surface particularly the bright wear band. Some astonishing reductions in adhesion result. Probably the same thing is behind much of the slippage of mine locomotives. The remedy is another matter, though keeping oil off rails presumably will help. **But it still doesn't look like there is any substitute for sand in certain spots at certain times.**

Welcome Follow-Through

"WASHINGTON, Sept. 13 (Special)—Eighteen oil companies today were warned that the government would set quotas on oil imports if voluntary limitations continue to fail. The warning was in the form of a letter from Arthur S. Flemming, head of the Office of Defense Mobilization, to major oil importers, and was the first time the government had threatened to use the new power conferred upon it by the new Reciprocal Trade Agreements Act."

Noting that while domestic crude production increased slightly more than 5% in the first 7 mo of 1955, while crude imports rose nearly 15% and residual imports over 23%, Dr. Flemming pointed out that this was considerably in excess of the Feb. 26 recommendation of the Advisory Committee on Energy Supplies and Resources Policy. He also noted that companies previously reporting to him on their future policy indicated that the excess would continue for the next several months. Consequently, he wrote, "it appears inescapable that in the absence of individual voluntary action by the importing companies over and above that already taken, the government will have to take action as provided in the Trade Agreements Extension Act of 1955."

Welcome follow-through.

About the Author . . .

HERMAN E. KNIGHT, until his resignation a few months ago, was general superintendent of Bell & Zoller Coal Co.'s West Kentucky Div., Madisonville, Ky. He was named to this post after serving about 5 yr as chief engineer, mining engineering, in the same division. Before leaving Bell & Zoller for other mining activities, Local Union 9566 of the Oriole Mine, Madisonville, Ky., presented Mr. Knight a Hamilton 21-jewel pocket watch, in recognition of the fine management-union relationship enjoyed under his leadership. Mr. Knight received his E.M. degree from the Colorado School of Mines. He is a member of the AIME and has been a registered professional mining engineer in Kentucky since 1950.

The Herman E. Knight Formula For Better Mine Management

1. **Tie units of production operation into smooth-working whole.**
2. **Anticipate and prevent trouble where possible.**
3. **Encourage ideas and idea-action.**
4. **Surround yourself with competent men.**
5. **Give due attention to each phase of production.**
6. **Adapt products to consumer needs.**
7. **Promote morale through personal inspections.**
8. **Set up and maintain an equipment-purchasing policy that is economical yet adequate to efficient, maximum production.**
9. **Coordinate production and sales.**
10. **Double-check before hiring additional personnel.**
11. **Avoid excessive authority.**
12. **Maintain profits by studious over-all management.**

A MANAGER IN ANY ENTERPRISE is in many ways similar to a catalyst, which is an agent with an uncanny ability to speed up a chemical reaction without becoming part of the reactants or of the product. A manager who manages all phases of mine operation must sacrifice some of the satisfaction of accomplishment which falls to the one who actually is so close to the individual phase that he personally assists, with his own hands, in its completion. The good manager must leave this pride of accomplishment with that particular individual and obtain his sense of accomplishment from integrating all parts into over-all completion.

TROUBLE: Think Ahead to Prevent It

The mine manager must think ahead, attempt to foresee areas or periods of likely trouble and then formulate a plan of action to combat such trouble. A good mine manager cannot allow trouble to be his "notebook." He must constantly strive to prevent mechanical breakdowns, trouble in labor relations, or loss of sales, instead of correcting the trouble after it has happened. The old saying, "an ounce of prevention is worth a pound of cure," is not outdated but many mines attempt to cure instead of prevent trouble where possible.

STAFF IDEAS: Spark Them for Progress

The person in charge who suppresses or discourages his assistants or supervisors from making suggestions or submitting ideas brings about a loss to his organization the same as if the machines were operated with the brakes partially set or dragging. A general superintendent or manager must surround himself with a staff of honest, reliable and well-trained men who are not afraid to disagree with him. Men who always have a "Yes" answer and who bring only glad tidings to the person in charge are not always the best for the property. This type of person may bring the manager short-range happiness, while the solid, rugged, well-trained and sometimes not-too-tactful staff member may cause some unhappiness in management meetings by disagreeing. However, these pillars have been known to give the manager much long-range happiness by helping to keep the operation solid and solvent.

A mine needs thinkers as well as doers. All accomplishments were ideas at one time. Most people have had good ideas, but did nothing about them, and later found that another had not only thought of the same thing but had actually made it a reality. Effort must be expended in changing an abstract thought to a concrete form.

Frequently some members of the supervisory team are afraid they will

overstep their bounds and tread on the toes of some superior, or are afraid they will be accused of usurping the power of their associates. Executives should lay down a clear-cut policy along these lines so that junior executives or supervisory people can do a good job and not lose their initiative. A small boy was leading an apparently sick dog down a street when an old man asked him what was wrong with the sick dog. The boy replied that the dog was not sick but had merely lost his "sicum." When a considerable number of members of any organization lose their "sicum," the firm will go into a lethargic or still state.

A good manager should know generally about everything. He should know as much detail as possible, but he should not have a sense of "not belonging," or be frustrated because he cannot do each job as well as the operator, or because he does not understand each department as thoroughly as does the supervisor. The manager is probably a very competent automobile driver but probably could not install a set of rings if his life depended upon it.

No manager should make the statement that he has been doing this or that for a long time and sees no need to change now. He should lend his ear to new ideas from his technical assistants, competitors, manufacturers and others. To guard against making radical changes, he could remember the old rule, "Be not the first on which the new is tried, nor the last to lay the old aside." This rule is possibly good for the ultra-conservative company or a small operator, but there are times when being the first is warranted, and other situations where it would be good business to lay the old aside last. We must change with the times.

PLAN THE JOB: First Things First

A person in direct charge of a mine and plant must be able to determine what is first in importance. The business at hand must then be conducted in such manner that each item, machine, phase or operation, unit section or department will receive supervision and concern in proportion to its importance in the chain of production or service. A manager can never pamper a phase of operation because that phase happens to be his main interest or hobby. A mine to be well balanced must consist of the necessary departments, each of sufficient size to carry its share of the over-all responsibility for creating a finished product.

If inefficiency or poor supervision exists at the face of the coal or point of production, no amount of study, concern, equipment or such, other than at this point, will increase the production of coal. Many managers are ardently interested or concerned with that particular phase of the operation with which they are familiar. Managers with accounting background frequently dwell too much on office procedure and those with maintenance training concern themselves too much with equipment condition. All departments are important or they should be discontinued. A good manager should render to each department or phase the attention warranted by its importance in the chain of production. The actual point of production is the life blood of the operation. A manager cannot raise production at a mine by conferring with the preparation manager any more than a farmer can grow healthy plants by fertilizing the leaves. Make the point of production as efficient as possible, and then this maximum production will indicate bottlenecks all the way to the loaded yard on top. A general tune up at a mine must be made from the face of the coal outward.

PRODUCT CHANGES: Suit the Customer

Many managers have an inherent love or like for certain sizes of coal and refuse or hesitate to change to sizes which the customer wishes to buy. They refuse until competitors have changed and made inroads into their markets. Alert managers must watch users of their products and contemplate changes at an opportune time if they wish to perpetuate the company. It is well to have great interest and like for a product but the customer is the final authority. Demand is a factor stronger than the desires of the board of directors.

OUTPUT: Adjust To Sales

There must be enough general coordination between the sales and the producing departments to eliminate asking the producing department to produce an excessive number of sizes of coal, types of coal, and specially treated orders. A preparation plant making five basic sizes can produce a combination of 20 sizes, but not profitably. If good coordination is not maintained between the sales and producing departments, the preparation plant will probably be so busy changing screens, washer settings and such that the quality and quantity will suffer. There should be enough exchange of information between departments so that each is basically familiar with the problems of other departments.

INSPECTIONS: Vital To Personnel Performance

Frequent inspections must be made by all the members of management. These inspections are not always to be made with the intent of finding things wrong or being done incorrectly, but also to provide opportunities for on-the-spot discussion with the people in charge of mines, plants and sections, units or departments. A good inspection usually gives supervisors and foremen new interest in their work. Good work should be praised in front of others and condemnation should be made privately. Poor attitude is a difficult thing to ferret out, but is usually indicated by weak concern for orders passed down from above and a lackadaisical manner of carrying out such requests.

A practice can easily grow at any mine or enterprise in which criticism of higher management by foremen in front of their men is common. This practice is conducive to poor work performance by the men. Dissension will multiply manyfold when foremen openly discuss the alleged faults of higher management. This practice should be discouraged at a new property, and should be guarded against as long as any mine has life. Mine operators would do well to determine if appreciation for good work is passed along down the chain of management in the same manner as condemnation for poor performance. A basic trait of the human race is a strong desire to be appreciated. Application of this rule can ameliorate or eliminate poor labor relations and make a pleasanter job for management.

Group effort is vital in the production of coal, but each foreman and crew likes to know their contribution to over-all production. Often, production can be raised and a mine made more efficient by installing a plan whereby the engineering department can determine the amount of coal produced by each unit or group. This information can then be made available in tabular form showing the percentage produced by each group. This plan of unit identity has proved a good incentive for efficiency at many mines.

PURCHASE: Economically But Adequately

A periodic check should be made in the designing, maintenance, purchasing and construction or mechanical departments to guard against a

Good Management Tenets

1. **A mine manager must have some course or goal and then be willing to change course as the future dictates.**
2. **The good manager must obtain his sense of accomplishment from his role in integrating all parts of the productive operation into a smooth-working whole.**
3. **A manager must constantly strive to prevent mechanical breakdowns, trouble in labor relations, or loss of sales, instead of correcting the trouble after it has happened.**
4. **The wise manager must surround himself with a staff of honest, reliable, well-trained men who are not afraid to disagree with him.**
5. **Executives should lay down a clear-cut policy so that junior executives or supervisory people can do a good job and not lose their initiative.**
6. **A good manager should render to each department the attention warranted by its importance in the chain of production.**
7. **An alert manager must cater to consumer preferences and consider product changes at the opportune time if he wishes to perpetuate his company.**
8. **A manager should arrange for adequate exchange of information between departments so that each is familiar with the problems of the other.**
9. **A shrewd manager should make frequent inspections to renew the work-interest of supervisors and foremen.**
10. **A mine manager must conserve supplies but he must also be careful to issue those necessary to obtain maximum, efficient production.**
11. **Managers must be assiduously careful to add only those men actually needed to maintain efficient operation.**
12. **A manager must exercise his authority with restraint or slowly but surely discover that he has less.**
13. **A manager, operating an average mine with no geographical, geological or documented advantage, must realize that his able management is vital to maintaining a margin of profit.**

myriad of shapes, forms and fashions of equipment when many could have been standardized. Much money can be made inactive in dead inventory through lack of standardization of equipment at any mine, factory, mill or plant. Standardization is sometimes difficult since it is easy for top management to allow each property or mine to make purchases of favorite equipment. Standardization must come from top management and future purchases should be controlled through set policy and familiarization with that policy by all concerned.

Mine managers, constantly bombarded with requests for more equipment, know that additional equipment is needed only if it adds to safety, productivity or quality. If life or limb is endangered, then no calculations are needed to determine if the addition is warranted. Otherwise the purchase must increase production enough to repay the cost of the machine, plus reasonable interest and profit on the invested capital. If these conditions are not met, then the loss on the machine may exceed the gain.

Salesmen and technical representatives are necessary in the operation of a mine but a manager must know what he needs, either personally or through his staff, and cannot allow sales company representatives always to tell him what he needs. When there is any doubt about future performance, and to make sure that the machine will do the job, use should be made of contracts and specifications. These precautions are made not to insinuate dishonesty but to guarantee a clear understanding of future intentions. A complicated oral agreement can cause ill feelings and poor relations during future periods of dissatisfaction.

An old proverb states that a man who will stoop to pick needles from the dust will never have a pound; another, that big oaks from little acorns grow; a third, that pennies make dollars. A middle of the road policy is a good place to start in conservation or purchase of supplies in mining. No manager in coal mining can allow supplies to be wasted. Neither can he be so falsely economical that he fails to issue the supplies absolutely necessary to obtain efficient, maximum production. A much needed shuttle car can never sit idle for lack of a cable. In any case, savings on the purchase or salvage of supplies must be enough to justify the effort. This is a simple and basic rule but many dimes have been spent to salvage pennies. A modicum of saving per unit is justified on items which are purchased by hundreds, thousands, or millions, but great effort cannot be expended on small items which are purchased only one or two times a year. Render to each item the effort due it. Probably 20 items will account for more than 70% of supply cost. Effort and concern should start with these items.

MORE MEN: Are They Really Needed?

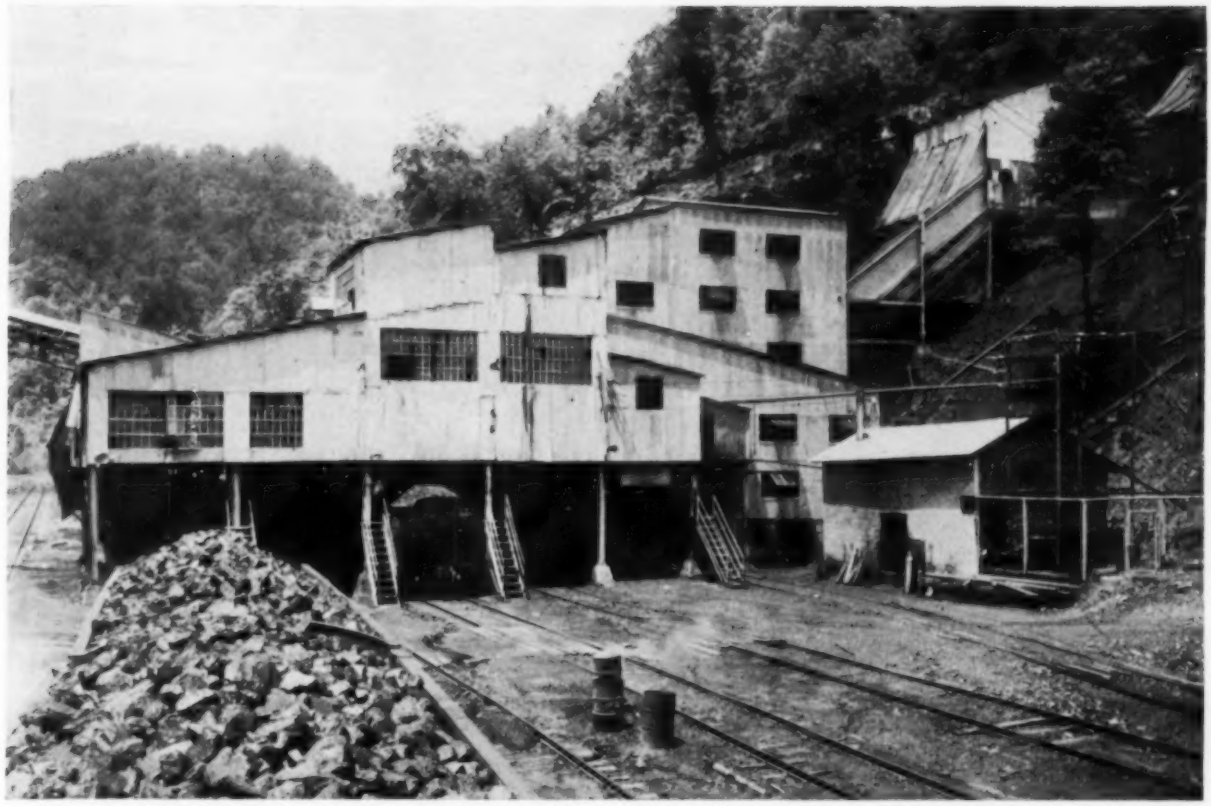
Mine management should make certain that additional men are actually needed before they are hired. Managers must constantly, diligently and intelligently be on guard that additional men are not added before actually needed to maintain efficient operation. Many enterprises have carelessly added personnel during early years only to discover sadly in later years that the operation is overmanned. It is more difficult to lay off a good, honest, loyal employee than it is to consider carefully the actual basic number needed and no more. Much thought by management should be required before a new job is created. The practice of "hiring at the portal" is gradually giving way to formal applications and thorough checking before an applicant is hired.

AUTHORITY: Use With Restraint

Any manager who constantly, and without restraint, uses all his authority will slowly but surely discover that he has less. You can vaccinate the people under you with so many small, petty and sporadic doses of instructions, commands, whims and requests that they will become immune to the main issue at hand.

ABLE MANAGEMENT: Profits Keystone

Unkempt plants, unsafe conditions, erratic production day in and day out, low morale and haphazard methods are sometimes the image of management drawn in red ink. Mineral deposits with great advantages in seam height, excellent roof and bottom, little water, and low freight rate can sometimes overcome poor management at the cost of lower unit profit. The average mine with no geographical, geological or documented advantage must have good management to maintain a margin of profit. If the cost of mining is to increase without a corresponding increase in the selling price of coal, then profits can be maintained only by a parallel decrease in supply cost and an increase in production. This dual saving can only be made by diligent, trained, patient managers who are properly oriented to their key position on the production team.



DROP-BOTTOM CARS discharge into bin and conveyor system at upper right to feed into new heavy-media structure.

Washing Increases Reserves

How a new heavy-media plant at Ethel Chilton Mines, Inc., permits recovery of thick areas of Chilton seam containing large amounts of near-gravity material

By J. H. EDWARDS
Associate Editor, COAL AGE

"ETHEL HAS HAD HER FACE LIFTED" reads a sales pamphlet of the A. T. Massey Coal Co., Inc., exclusive sales agent for Ethel Chilton Mines, Inc., Logan County, West Virginia, reflecting the recent installation of a 250-tph heavy-media plant and other improvements which have returned Ethel mine to the 2,500-tpd (clean-coal) class.

A McNally-Tromp heavy-media unit equipped with an automatic gravity regulator, is washing 14x$^{3}/_{16}$ coal in one bath, making a product containing less than 5% ash and with misplaced materials in clean coal and refuse totaling less than 1% of the raw feed to the bath. Magnetite consumption is averaging 0.377 lb per ton of raw feed to the bath. An abandoned section of the mine is used as a settling pond.

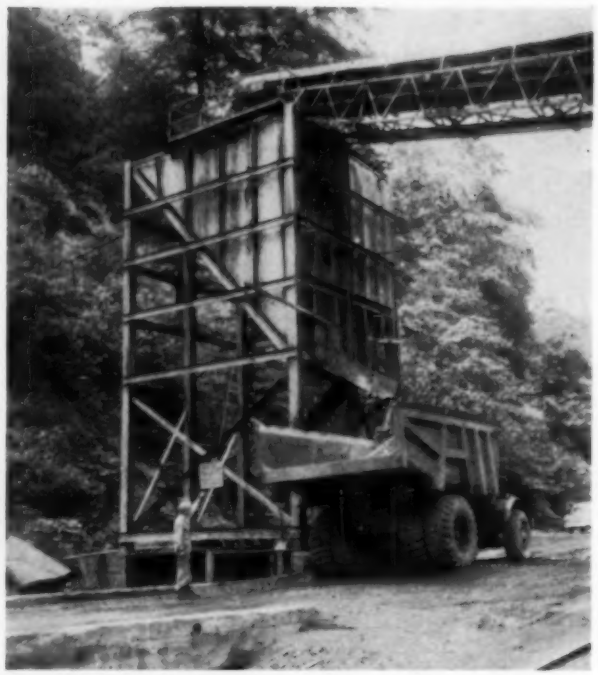
Outside haulage from the mine to cleaning plant has been improved by replacing truck haulage with a track system including drop-bottom cars and electric locomotives.

Ethel Chilton Mines, Inc., was incorporated in 1944 to operate the Ethel property. L. L. Burns is president; W. E. Massey and John V. Ray are vice presidents; and C. W. Jones is general manager. At the mine J. J. Burns is superintendent; E. T. Hale is general mine foreman; W. S. Massengill is chief electrician; Stanley Petrosky is day tipple foreman; and D. E. Copley night tipple foreman.

COAL SOURCE—CHILTON SEAM

Mining is in the Chilton seam, ranging from 56 in to 9 ft in thickness. It includes the usual Chilton bone, from 2 to 6 in thick, which varies in position from 5 to 40 in above the bottom. Above the seam is the Chilton rider coal, the interval between seam and rider feathering out to nothing on one side of the mine. The seam and the rider coal are mined together when the interval is less than 18 in, but when the interval is greater only the Chilton is taken.

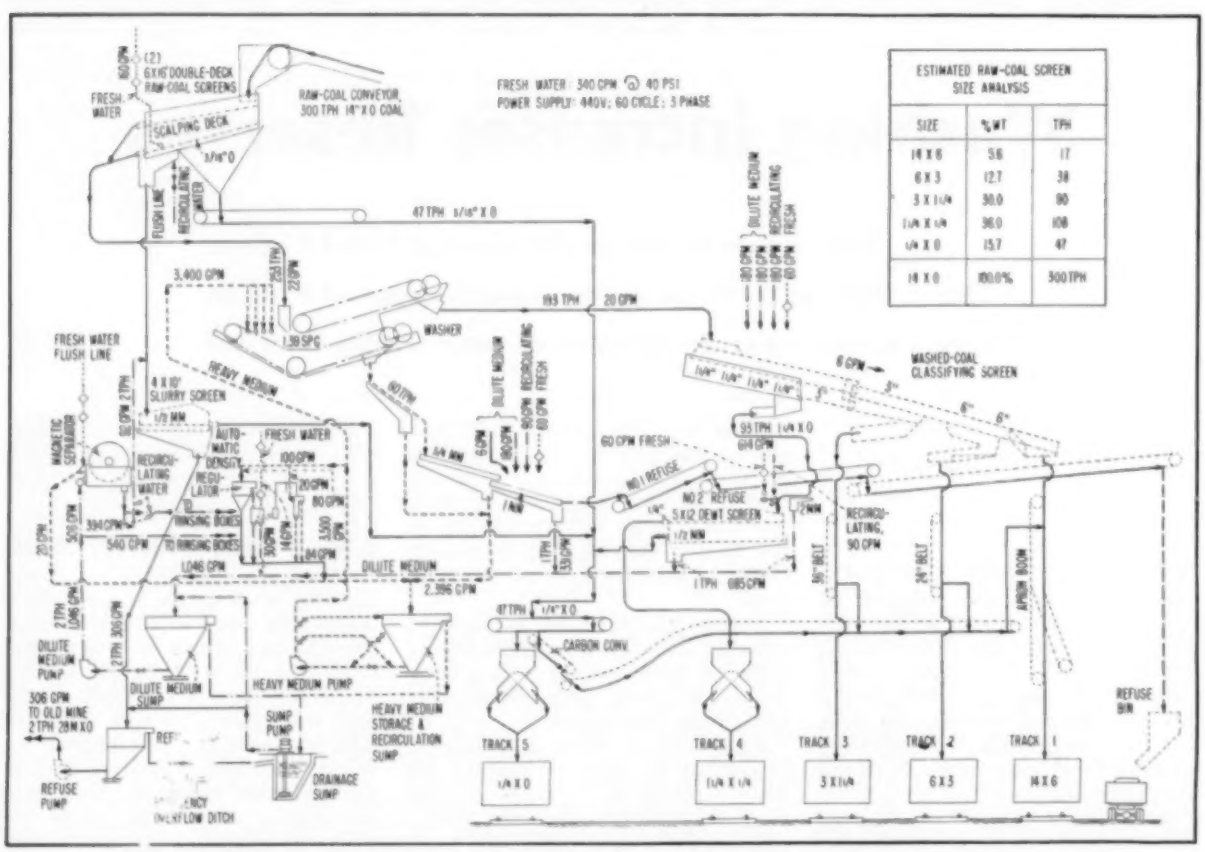
The coal outcrops in several places



Improved Surface-Haulage Facilities Lead to Higher Efficiency . . .

10-TON DROP-BOTTOM CARS haul run-of-mine over 8,200-ft tram road from portal bin to tipple in new system.

22-TON DUMP TRUCK, formerly used for hauling coal, now hauls washery refuse away from plant area.



HEAVY-MEDIA WASHING EQUIPMENT, symbolized at the left in the diagram above, is tied into existing clean-coal screening and loading units in 5-track tipple. An underground section serves as a settling pond for washery water.

on the property, dipping 3½% or more toward the tipple, where it is 80 ft underground and was originally worked from a slope. When this area below drainage was mined out some years ago, crop openings were made in a hollow about 1½ mi from the tipple and the coal was trucked to the plant. Now the opening on one side of the hollow leads to the low-coal area of the mine and the opening on the other side to the high-coal area.

The high-coal area could not be operated prior to the installation of the new washer because of excessive amounts of near-gravity material. The old washer would not turn out a satisfactory product with reasonable loss of coal to refuse. Since completion of the new washer, however, at least half the mine production comes from the high-coal area.

PLANT-FEED UNITS include new 100-ton bin at left and a belt to transport R-O-M to tipple headhouse (right) into which trucks formerly dumped.

IMPROVING SURFACE FACILITIES

Somewhat over a year ago an 8,200-ft tramroad was built from a 300-ton mine-car dump bin to the tipple. The bin previously had been used to load trucks. Thirty 10-ton drop-bottom cars were purchased for the new tramroad. Haulage power is provided by a 15-ton Goodman locomotive and a tandem of two 8-ton Jeffrey units. The haulage-improvement program also included the installation of a 100-ton bin near the tipple to receive coal from the drop-bottom cars, and a chain feeder and a 100-ft belt conveyor to the bin where the trucks formerly dumped.

The existing tipple, left for the most part unchanged, is a steel structure with screening and mixing equipment and five loading tracks. Only limited room was available between the tipple and hillside in which to install the structure housing the McNally-Tromp washer and auxiliary equipment. The McNally Pittsburgh Mfg. Corp. handled the design and erection, bringing the plant into operation in September, 1954.

On an apron-type picking table, handling plus 6-in raw coal from a grizzly, slate and bone are raked to one side and the coal to the other. At the end of the table the slate drops to a refuse conveyor and the coal to a crusher which reduces it to 14 in.

On two 6x16-ft Allis Chalmers Ripl-Flo double-deck vibrators, handling the 14x0 raw coal, the minus ⅜-in is removed and the 2x⅜-in fraction is prewetted by sprays before joining the 14x2 to comprise the 14x⅜ feed to the McNally-Tromp bath. The washer is 9 ft wide and the moving parts consist of two conveyors. The bottom strand of the top conveyor drags the float up an inclined apron. The top strand of the lower conveyor drags the sink up another inclined apron located under the clean coal apron. Although rated at 250 tph, the washer can handle surges of 300 tph of Chilton coal, according to company officials.

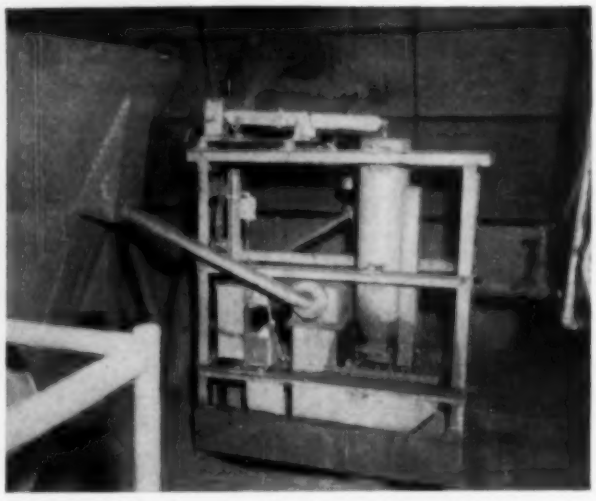
HIGH PART OF PLANT, housing heavy-media washery, had to be designed to fit between older plant and steep hillside to eliminate excavation work.

The clean coal is dewatered and classified on a shaker which was remodeled from the original main shaker of the plant. Sizes above 1¼-in move directly to Tracks 1, 2 and 3. The 1¼x⅜ goes to a stoker vibrator for further washing to reclaim magnetite, and for dewatering and classifying. This screen is a 5x12-ft Allis-Chalmers Low-Head double-deck unit from which the 1¼x¼ goes direct to Track 4. The dewatered ¼-inx½-mm joins the dry ⅜x0 from the raw-coal screens and the dewatered ⅜x½-mm from a slurry screen to make the product loaded on Track 5.

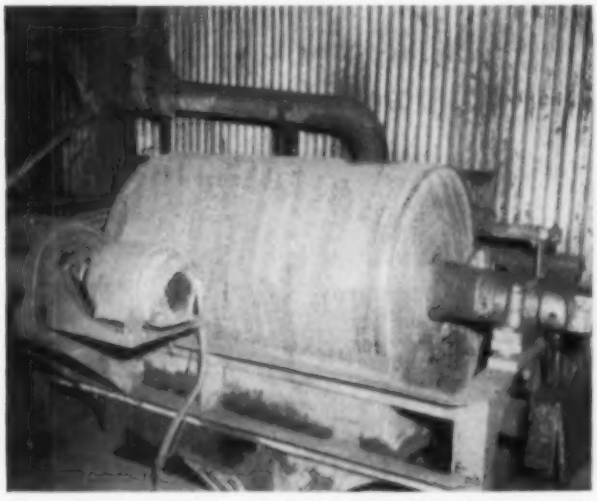
RECLAIMING MEDIUM

Magnetite is washed from the Tromp refuse on a set of high-speed short-stroke shakers, the heavy-medium water going to the heavy-medium storage and recirculating sump and the dilute medium to a dilute medium storage sump. Dilute medium also drains to this sump from the stoker screen. This sump also receives the discharge of a drainage sump pump. Dilute medium is pumped from the dilute medium storage sump to a magnetic separator. Heavy medium drains from the magnetic separator to the heavy-medium storage and recirculating sump.

Heavy-medium circulation is handled by a 2,600-gpm Hazleton pump



SEPARATE CONVEYORS for float and sink products are about the only moving parts in the washing unit (left). Automatic gravity regulator (right) injects water into densified medium as needed to control gravity of bath.



MAGNETITE in wash water is densified on this magnetic drum and washed off by fresh-water sprays.

MEDIUM is recirculated by this 2,500-gpm pump driven by a 100-hp motor, largest in the plant.

DC POWER for drum-type magnetic separator is converted in this selenium rectifier.

D. E. COPLEY, night tipple foreman, shows plant-control desk featuring indicator-type push buttons.

FIREBOSS COLUMBUS KEATLEY shows seam with boney near floor.

CONVENTIONAL LOADING MACHINES, shuttle cars, and shortwalls are main face units in thick coal.

driven by a 100-hp Allis-Chalmers motor against a 63-ft head. The dilute medium pump is a 1,046-gpm Hazleton driven by a 50-hp Allis-Chalmers motor. The magnetic separator is a Jeffrey-Traylor unit of the magnetic drum type. The magnetite lifted out of the dilute medium is washed off the drum with fresh water sprays.

Bee-Zee Tri-Rod screens are used on the stoker vibrator and on the slurry vibrator, which is a 4x10-ft Low-Head unit.

The automatic regulator tests and regulates the gravity by removing or adding magnetite-free water to the heavy-medium system.

PROVIDING PLANT WATER

Black water from a slurry screen and from other points of waste is discharged into the slope that served the original mining area. Thus, the plant has no stream-pollution problem. Water level in the abandoned mine stands 75 ft below the top of the slope. Clean water for the plant is pumped from a point several hundred feet from the slope bottom. The mine provides plenty of water the year around.

Plant refuse is hauled about 9,000 ft upgrade to the disposal ground by a Euclid 22-ton rear-dump truck working two shifts, as does the plant and the mine. There is a spare truck of the same type on hand. It and the one in use were formerly used to haul coal. Total reject from the plant is approximately 20% of the raw coal dumped.

Sizes of coal usually loaded are 6-in lump, 6x3 egg, 3x1¼ nut, 1¼x¼ stoker and ¼x0 carbon.

Plant erection and wiring was done by Silas Campbell, Contractors, Harlan, Ky., who also built the bench-type control board using Allen Bradley

DRAG HEADER in background levels 4-ton mine cars at loading point to a height which will clear low roof and headers on the main haulageway.

indicating push buttons. DC for the magnetic separator is supplied by a General Electric selenium rectifier.

UNDERGROUND METHODS

The mining plan calls for pillar extraction in the low-coal area and honeycombing in the high-coal area. In the low area the bottom is hard and in the high area it is fairly firm fire clay. The top in both areas is a strong sandstone.

Five mining units are equipped with Joy machines consisting of five loaders (three 14-BU and two 8-BU), 10 32E16 shuttle cars, elevators discharging to mine cars, spotting hoists, and 7B shortwall machines with 9-ft bars using Carboloy bits. Machines are carried on T-2 trucks.

On two sections coal drilling is done with hand-held electric drills and on three other sections by Schroeder hydraulic drills powered from hydraulic pumps mounted on the T-2 machine trucks. Carboloy bits (2 ⅝-in diameter) are used on all coal drills. It is planned to standardize on the hydraulic drills. The coal is broken with Airdox.

Up to the present no roof-bolting has been done in the mine but it is being considered for some sections of the main haulway.

Mine cars are 4-ton drop-bottom type and the maximum haulage distance is 4 mi. Intermediate locomotives are not used in the low-coal area but are used in the high coal and are of 6- and 8-ton sizes. The mainline locomotive is a tandem machine made of two 8-ton units. Substations are outside, and the equipment consists of two motor-generators and three synchronous converters.

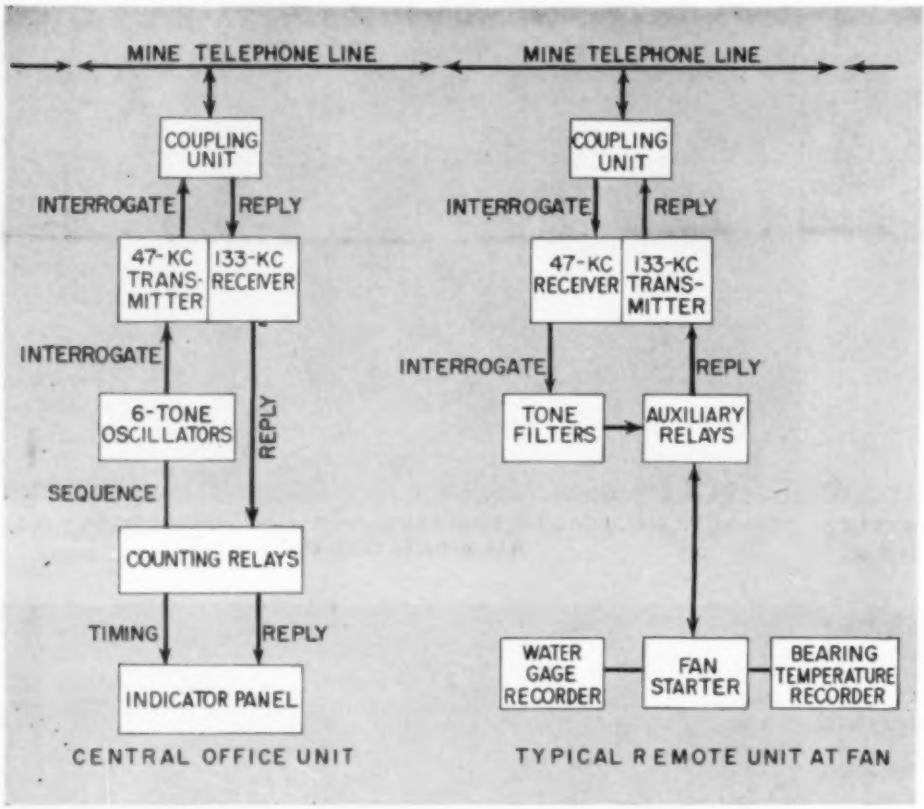


FIG. 1—REMOTE INDICATION OF FAN OPERATION is provided by this carrier-current system, which shows schematically the setup and equipment at both the central station and a fan being monitored.

How Robena Uses Carrier Current In Fan and Substation Control

PROBLEM: Monitoring and controlling outlying fans and substations operating without attendants economically and effectively.

SOLUTION: Carrier-current indicating and control systems using telphone lines for transmission.

By ROBERT R. GODARD
Electrical Engineer, Frick District
United States Steel Corp.

CARRIER-CURRENT EQUIPMENT utilizing radio frequencies transmitted by wire was first employed in coal mining approximately 10 yr ago to provide voice communication for haulage control and dispatching. Subsequently, the carrier-current principle was extended to control and signal devices to promote safety and cut operating costs. Two applications of saving manpower and money in the such control and signal equipment are operation of outlying fans and substations at the Robena mine of the United States Steel Corp., in Greene County, Pennsylvania.

Fan Signals

Robena mine, encompassing approximately 20,000 acres, is ventilated by seven propeller-type fans. Lamphouse assistants and other employees, in addition to their regular duties, provide the fan attendance required by Pennsylvania bituminous mining law at the five shafts with personnel service or coal-preparation facilities. Elimination of the need for fan attendants at two remote non-entry shafts, Bailey and Hartley, could only be achieved by installation of a fan-signal system to transmit data on fan operation from these shafts to mine headquarters at Colvin shaft. Because distances of approximately 4 mi from Colvin to Bailey and 2 mi from Colvin to Hartley made installation of separate circuits to carry the signals economically impractical, carrier current on the mine telephone system was a logical answer.

The system selected is shown schematically in Fig. 1. As presently set up, it can make successive continuous checks of a maximum of 12 remote fans with two carrier frequencies.

The central office or master con-

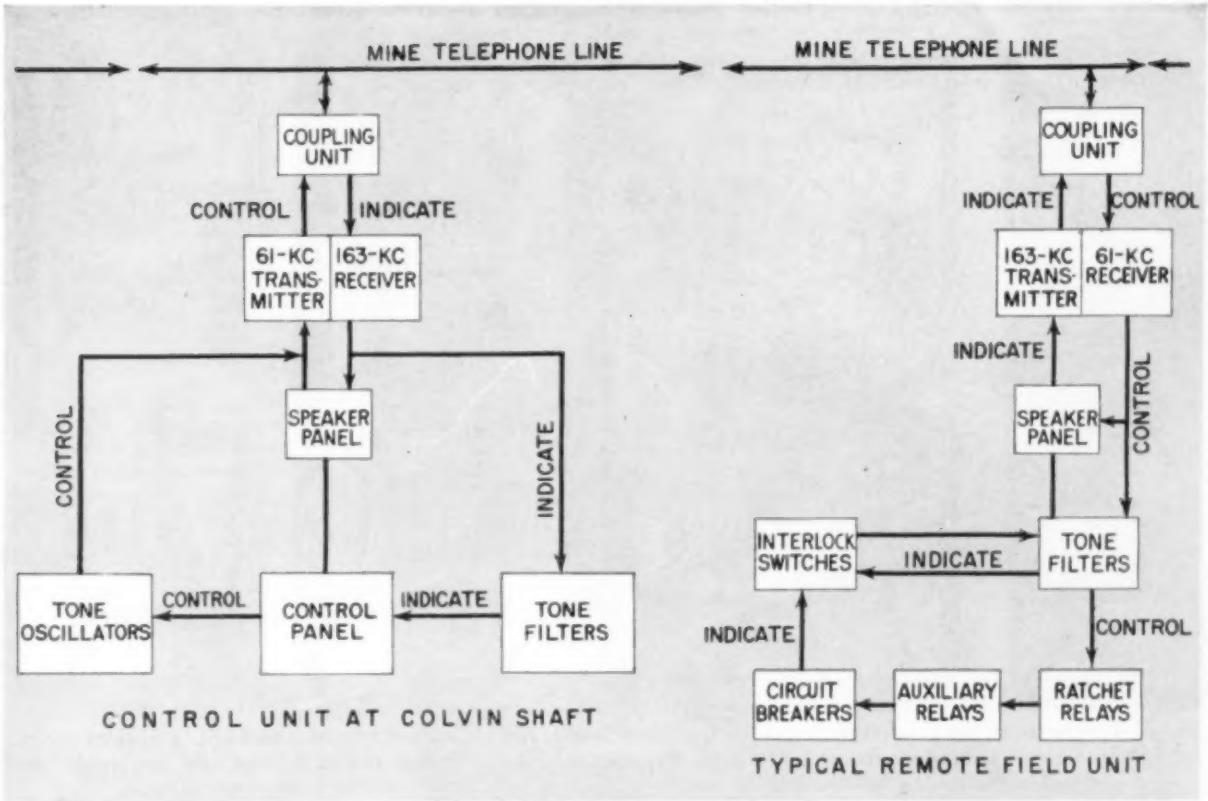


FIG. 2—SUPERVISION OF OUTLYING SUBSTATION OPERATION involves central unit at the control station and remote unit at the substation. Breaker position can be checked and changed at will from the central station.

trol unit installed at Colvin shaft is illustrated in Fig. 3. This unit consists of a chain of counting relays; a 47-kc frequency-modulated carrier transmitter; six tone oscillators, each operating on different audio frequencies for modulation of the 47-kc transmitter; 133-kc carrier receiver; red and green indicating lights; and alarm-reset buttons.

A typical remote field unit located at each fan to be monitored also is shown in Fig. 3. It contains a 47-kc carrier receiver, band-pass filters for appropriate audio frequencies, 133-kc carrier transmitter, relays for circuit connection to fan auxiliaries, and the necessary power sources.

CHECKING THE FANS

Operation of the system is simple and foolproof. It is based upon sequential interrogation of, and reply from, the fans being checked.

The chain of counting relays in the central-office unit operates continuously to establish system timing and to apply power to tone oscillators in selected sequences of two. The continuously energized 47-kc transmitter is frequency modulated by these tone oscillators in the order 1-2, 1-3, 1-4, etc., for interrogation of each fan. This modulated signal is received by all remote 47-kc receivers, but is responded to only by the unit equipped with the correct audio filters for the combination of modulating frequencies required to check that specific fan.

At each remote location, in turn, operation of tone filters and associated relays energize the 133-kc transmitter to return a signal to the central office unit. Absence of this return signal in its proper order will sound an alarm.

A green light for each fan location blinks repeatedly on the master control panel when the fans are functioning correctly. Fan failure or failure of any portion of the remote equipment will extinguish the green light for that fan and energize an alarm horn. When the horn-reset button is depressed, the horn is silenced by removal from the circuit of the fan in trouble, and a red light is energized to indicate uncorrected failure.

THREE-PLY PROTECTION

Connection of the remote units to fans being monitored is made through an auxiliary relay in the fan-motor starter. Low-pressure contacts on water-gage recorders, and over-temperature contacts on bearing-temperature recorders, are also wired to the fan starter to deenergize the motor should loss of water gage or bearing over-temperature occur. Thus, any of the following events will shut down the fan, prevent the control-unit interrogating signal from energizing the 133-kc transmitter at the fan, and thereby activate an alarm at the central-office unit:

1. Operation of protective devices in the motor starter (overload, phase failure, phase unbalance, loss of motor synchronism, power failure).
2. Bearing over-temperature.
3. Fan "stalled" because of air restriction.

This system has been in operation since May, 1955, and has effectively demonstrated its ability to provide the degree of protection necessary for non-attended fan operation in a highly gaseous mine. By the elimination of three labor shifts per fan per day at only two fans, the net savings will recover equipment and installation costs in approximately 6 mo.

Substation Supervision

DC for mining in Robena is obtained from conversion units installed in nine surface substations, seven of

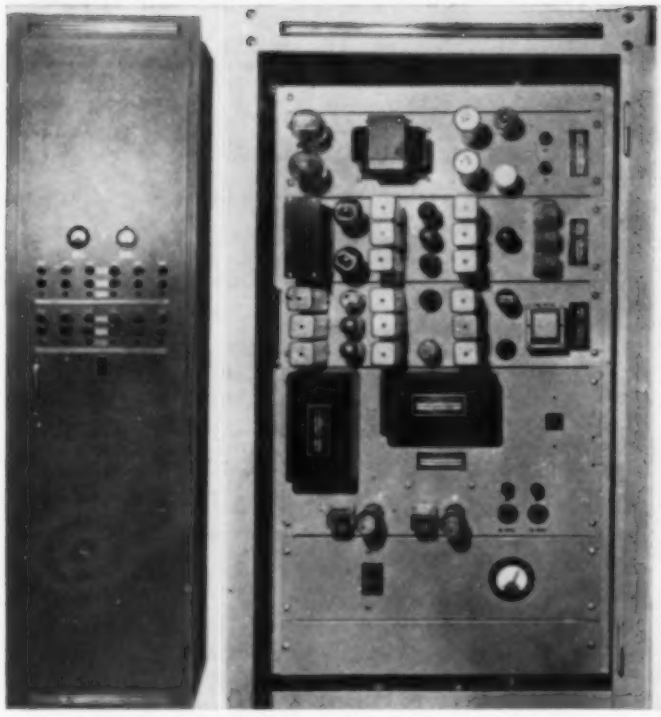


FIG. 3—FAN-MONITORING UNITS include central office unit (left) and field unit for installation at fan (right). Two carrier frequencies check a maximum of 12 fans.

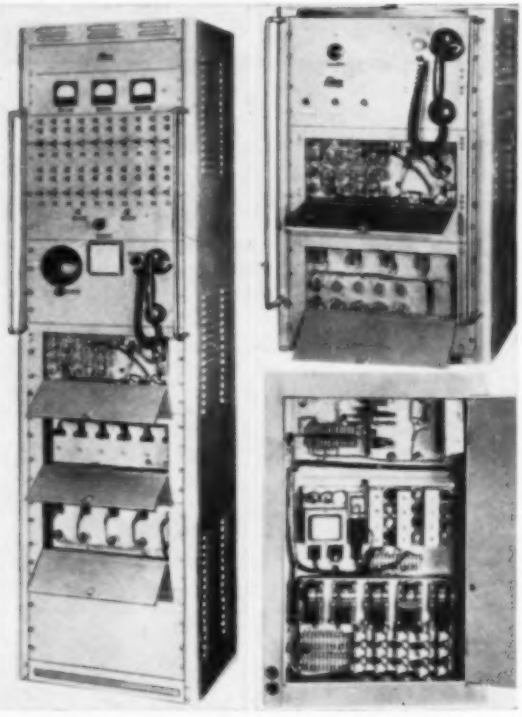


FIG. 4—SUBSTATION CONTROL EQUIPMENT includes central unit (left) and field unit (right) for remote breaker operation.

which operate without attendants. Distances between stations and general inaccessability made it difficult to quickly cut power off the mine in event of a fan failure. In June, 1953, a carrier-current supervisory control system using a telephone circuit for transmission was installed to provide, from Colvin shaft, control of DC circuit breakers on rectifiers and motor-generator sets in remote stations.

The system is designed to select circuit breakers, indicate their position, change circuit-breaker position, and indicate that the change has been completed. A total of 20 breakers, with a maximum of three in any one substation, can be individually interrogated and controlled.

Components of the central office, or control unit, and of the field units, are shown in Fig. 2.

BREAKER SELECTION

As with the fan-signal system previously described, sequential modulation of the 61-kc control-unit transmitter by selected pairs of audio tones is the basic operating principle.

Source of the audio tones are the six-tone generators or audio oscillators in the control unit. Five of these tones are used in sequential combinations of two for circuit-breaker selection. The sixth audio frequency is used exclusively for breaker operation.

When a circuit-breaker selector key is depressed on the control unit panel, Fig. 4, the 61-kc transmitter is modulated by two audio frequencies. The first of these audio tones starts instantly; the second follows 600 milliseconds later.

All field units, Fig. 4, receive the modulated carrier. However, the frequencies of the carrier modulation and their time sequence determine which circuit breaker will respond.

One of the two transmitted tones, after detection, modulates the 163-kc field-unit transmitter to return a signal to the control unit. Breaker position, opened or closed, determines which of the tones will be returned. After being received at the central-office unit, the returned tone will control red or green lights through relays to indicate the position of that particular circuit breaker.

CHANGING BREAKER POSITION

To change the position of a breaker, an "operate" button on the control-unit panel must be depressed while the selector key for that breaker is held down. This causes Tone No. 6 to modulate the 61kc transmitter simultaneously with the breaker-selection tones. Relays are operated in the field unit to change breaker position when the "operate" tone is received at the remote location. The field unit then returns the "operate" audio signal to the control unit, where other relays energize the "check" light on the control panel.

As noted in the schematic system diagram and the photographs of the units, two-way voice communication also is provided between control and field units. Appropriate time-delay relays are installed in the field units to prohibit random combinations of voice frequencies from causing false operation of breakers.

Unlike the fan-signal system, this control device operates only when necessary. To establish system integrity and insure that the control is functioning properly, all breakers are operated daily from Colvin shaft between the third and first shifts at a time when mine load is low.

Prior to the installation of this system, removal of power from the mine required that maintenance men drive to each remote station—a trip of 30 to 50 min, depending upon weather. With supervisory control, it is possible to remove all power in approximately 4 min.

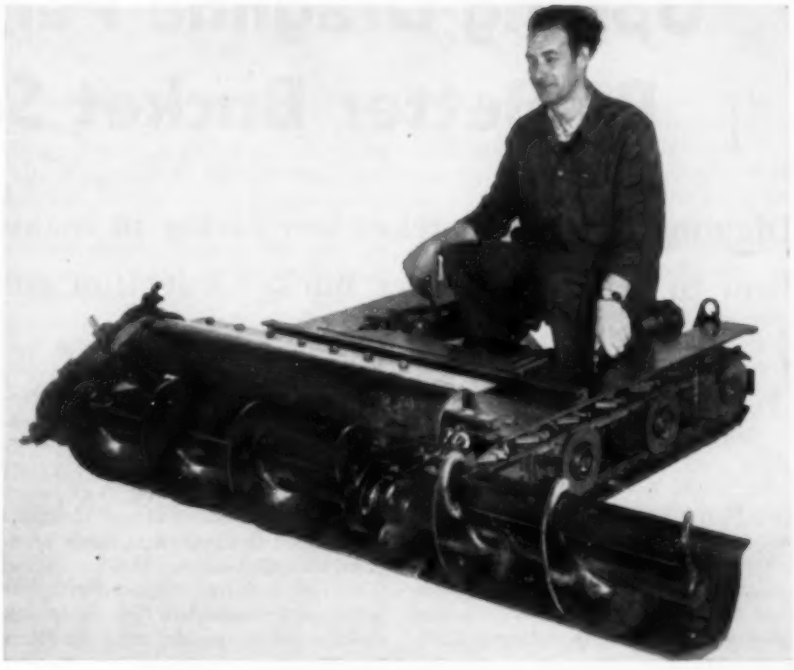
Carrier current, although not a new medium, is a powerful and flexible tool for the mining industry. Other applications involving control, signalling and communication are limited only by the imaginations of the operators and manufacturers.

Then and Now In Stripping

BRAVELY FLAUNTING a plume of genuine coal smoke, the long-boom full-revolving shovel shown at the right went into operation in Kansas in 1910. It was one of two units installed by Patrick Durkee and Joseph Stephenson, and was the first to be built and shipped by a company later acquired by the Bucyrus Co., of S. Milwaukee, Wis., now the Bucyrus-Erie Co. Bucyrus-Erie this year is celebrating its 75th anniversary as a pioneer and world leader in the manufacture of excavating equipment.

Equipped with a 55-ft boom and 40-ft handle, this steam-powered machine carried a 2½-cu yd dipper. It was the forerunner of the modern electric machines of today with Ward-Leonard control and crawler mounting, such as the 1050-B illustrated, with 113-ft boom, 64-ft handle, 45-cu yd dipper and a dumping radius of 114 ft at a height of 74 ft.

Mighty Midget



A LOW, LOW crawler-mounted loading machine, which also can be adapted for both cutting and loading, is being developed by two Belgian organizations for use on longwall faces in both level and steeply pitching coal in Europe. The loading mechanism, as shown in the illustration, is a helicoidal screw, which can be mounted to discharge either right or left. The driving chain on the face side is equipped with cutter bits so that the machine can make a clean cut on its way through. Screw and trough are in two parts so that half can be removed to permit the machine to tram and work in minimum width. The screw discharges to an "armored" flexible conveyor along the face.

Screw and trough may be raised and lowered, and the machine is designed for both thick and thin coal. Height of the prototypes model illustrated is 16 in. Weight is approximately 3,300 lb. The machine is operated by three compressed-air motors totalling 17 hp. It is being developed by the Institut National de l'Industrie Charbonniere, of Liege, Belgium, and the Fabrique National d'Armes de Guerre S.A., Herstal-lez-Liege.

Upping Dragline Performance By Better Bucket Selection

Digging ability of bucket key factor in maximum dragline output. How to get it by proper bucket selection and operation.

By L. W. OLSON, Field Engineer
Page Engineering Co., Chicago

DEEPER COAL STRIPPING is the rule today, mainly because a very large percentage of surface or near-surface coal has already been recovered. As their contribution to maintaining efficiency in this deeper work, manufacturers have provided new and better-designed equipment. Draglines, for example, have been fitted with longer booms and their power has been increased, enabling strip mines to recover coal *economically* at depths that, only a few years ago, made operation well-nigh impossible.

Unlike a shovel, where the dipper is forced or crowded into the material by power, results with draglines are entirely dependent upon the digging ability of the bucket. Putting it another way, the finest dragline is, in reality, only as efficient as the bucket that hangs at the end of its boom. The greatest problem in dragline bucket performance is the fact that the pull of the loadline is in a direction that tends to lift the bucket off the ground. In other words, the pull is at an angle to the direction of

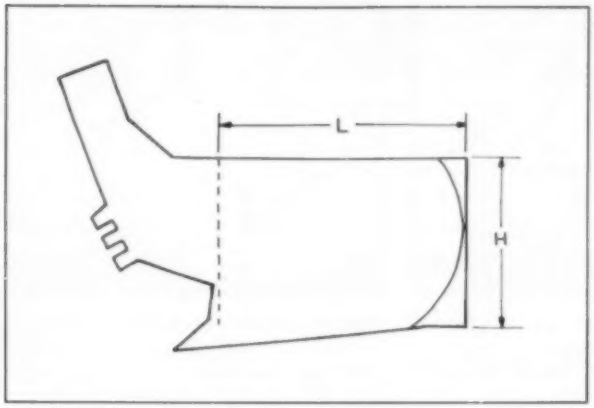


FIG. 1—GROSS BUCKET DISPLACEMENT is obtained by multiplying length, width and height.

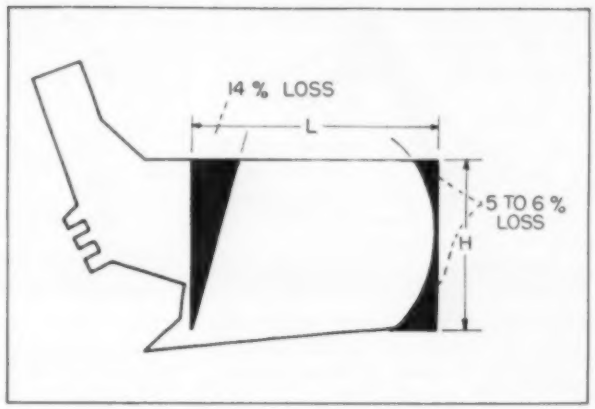


FIG. 2—TRUE BUCKET CAPACITY is found by deducting losses as indicated from gross displacement.

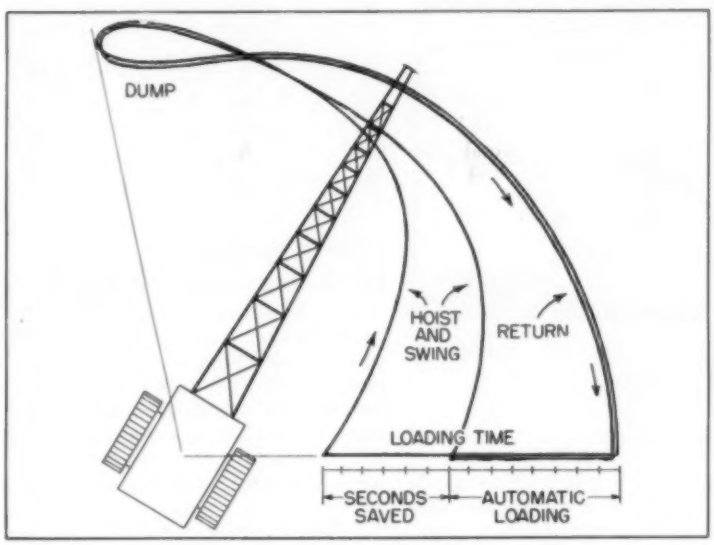


FIG. 3—GOOD BUCKET DESIGN cuts loading time from 14 sec to 8 as a result of improved digging ability.

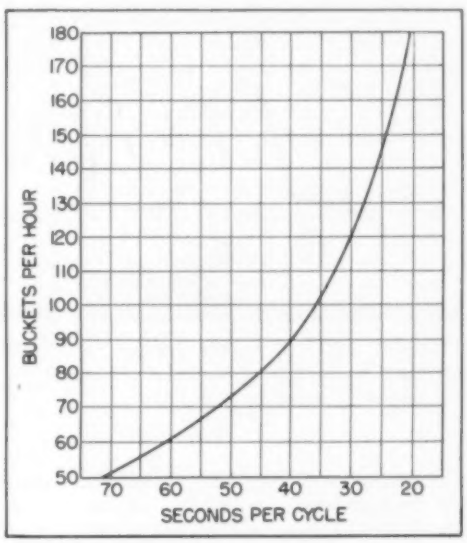


FIG. 4—MORE BUCKETS PER HOUR reflect reduction in seconds per cycle by faster loading.

digging, and the only resistance to this lifting effect is the design of the bucket. The dragline's primary functions are providing the muscle power needed to actuate the bucket and furnishing a means of lifting and moving the material. Beyond this, the dragline itself can do very little. It is digging qualities of the bucket that determine whether an operation is highly successful, average or a failure.

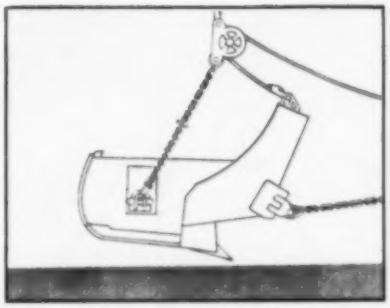
Therefore, in this new picture of strip mining at deeper levels, the dragline bucket—and specifically its inherent digging ability—becomes tremendously important, since economical recovery is dependent on how well a bucket digs at deeper levels, and how much material it can move—consistently, easily and rapidly.

The only force available to make a dragline bucket "dig in" at deeper levels is the bucket's weight. Once the bucket bites in or starts to penetrate, the angle of the teeth to the ground causes it to be drawn farther down as pull is applied to the loadline. Any bucket will dig after a fashion when level with the machine or at relatively shallow depths, because the pull on the loadline draws the bucket through the material. For best results and top production when digging below the level of the machine, or in tough material, a dragline depends entirely upon a bucket design and balance that takes full advantage of its total weight.

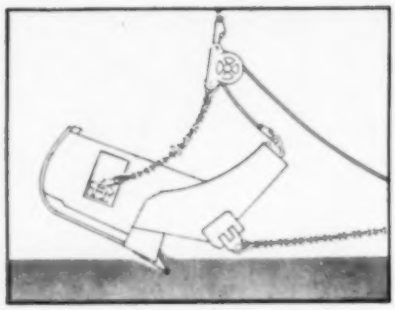
BIG PROBLEMS: Hard Material, Deep Digging

As digging depth increases, the direction of the pull on the loadline becomes more acute, and the tendency is to lift the bucket out of the material. This pull must be resisted by designing the bucket, as previously noted, so that its entire weight is utilized not only for this purpose but for penetrating hard materials, such as, shale, slate and blasted rock. To meet this problem of digging harder materials at deeper levels, bucket manufacturers have employed two basic approaches.

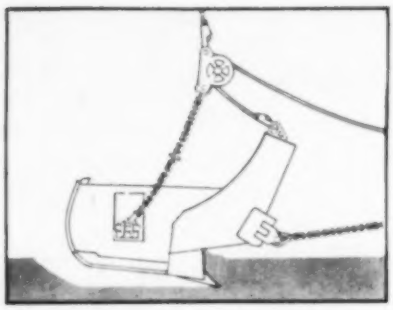
One approach consists of increasing the "suck" of the teeth. This is done by mounting the teeth at a greater downward angle in relation to the bottom of the bucket, and also by elevating or raising the position of the hitch plates. It can be readily understood that the suck of the teeth can be increased to a certain degree only, after which increasing the angle becomes a detriment, since the teeth are dragged through the material in a raking action, exposing the flat face rather than the sharp digging points.



STARTING FROM FLAT POSITION, bucket is ready for pull—no need to drop it on its teeth to start digging.

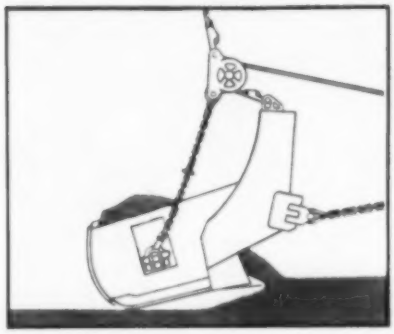


WITH SLACK HOIST and tension on loadline, bucket promptly assumes digging position with full weight on teeth.

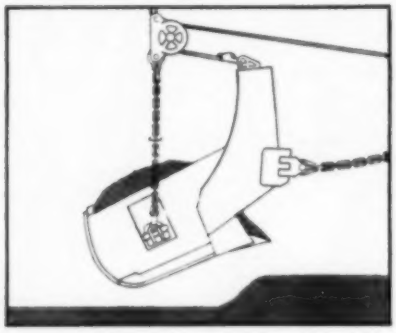


CONTINUED PULLING LOADS in one or two lengths. Digging is smooth with no material buildup in front.

FIG. 5—How a Well-Designed Dragline Bucket Digs and Fills



FILLING ACTION causes bucket to level off as weight of material shifts center of balance to the rear.



COMPLETELY FILLED, bucket is ready for hoisting. No need to continue dragging and thus waste time.

Buckets employing this principle are designed to operate with the entire bottom resting on the ground and the weight fairly evenly distributed between the teeth and the rear, or heel, of the bucket. When the bucket is dragged across the ground, the "suck" is relied upon to make the teeth catch or snag on projections or in soft spots, drawing the bucket into the material. In shallow dragging, this design will give fairly satisfactory results in most materials. As the depth increases, however, the direction of the pull on the loadline becomes more and more in an upward direction. Consequently, since the total bucket weight is evenly distributed between the teeth and the rear of the bucket, any upward pull is resisted only by the weight of the front end and not by the total bucket weight. Finally, as depth continues to increase, the upward loadline pull offsets the weight of the front end and, in effect, lifts the teeth off the ground. When this occurs, the all-too-familiar experience of not being able to "maintain grade" is encountered.

The automatic bucket is designed to take advantage of the basic laws of gravity and balance. It is constructed so that the balance of weight and the center of gravity are in perfect equilibrium. The slightest pull on the loadline immediately shifts the center of balance, tilting the bucket forward and throwing the entire weight of the bucket on its teeth, causing it to assume its digging position *automatically*. This feature of the automatic bucket permits it to dig equally well on the surface or 100 ft down, and even at angles up to 45 deg. At the same time, this tilting or lifting action increases the angle of the teeth to the ground so that they are *automatically* presented at the most effective digging angle, even though they are mounted on the bucket at a much smaller angle than the teeth of other types.

Power required to pull the bucket through the material is reduced because the suck of the teeth is not completely relied upon for the digging action. Once the automatic bucket has started to dig, the weight of the material in the rear shifts the center of balance, causing the rear to drop and level off. Then, the bucket begins to rise. This decreases the "bite" that must be broken loose when the bucket is fully loaded. By concentrating its entire weight on the teeth, the automatic bucket offers the utmost resistance to the upward pull of the loadline, and therefore will continue to dig far beyond the point at which the ordinary bucket ceases to operate or maintain grade.

PROPER BUCKET: Small Investment, Big Payoff

The increased efficiency of the proper bucket is reflected throughout an entire operation, a fact that is very often overlooked when selecting a bucket. This reflects the fact that the cost of a bucket, as compared to the cost of the dragline on which it is used, is relatively small, yet this nominal cost is of greater importance in the final outcome than the dragline itself. A bucket that will increase production 10 to 25% is equivalent to a 10 to 25% increase in the capacity of the dragline, and it is common knowledge that it costs a small fortune to increase a machine's capacity. Therefore, an excellent bucket is to an average or ordinary bucket as a 20-yd machine is to a 15-yarder. In addition, a 10 to 25% increase is reflected in the over-all efficiency of strip operation—more overburden removed, more time saved and more coal uncovered.

No one, seriously, would send a boy to do a man's job, and the same rule applies in the selection of a bucket. Choosing the right bucket for the job is important not only in bucket life itself but in the attainment of the highest possible production. Basic factors involved in selecting a bucket are two:

1. The operation and the type of material to be worked.

2. The power or capacity of the machine.

Knowing these, it is possible to determine the proper class or type of bucket and the correct size or weight needed for perfect balance, in turn leading to fastest possible cycling and top production. A too-commonly-held belief is that the larger the bucket, the greater the production. Unless the operation is carefully studied, this belief may be in error. Efficient, economical digging depends upon complete data on (1) the type of material to be worked, (2) the depth of digging and (3) the power or capacity of the dragline.

If, for example, a light-duty bucket is used for digging in hard, blasted rock, it will not stand up to the heavy battering and will soon be damaged beyond productive use. On the other hand, it is foolish to use a heavy-duty bucket designed for hard, rough service to work loose, easy material.

The depth at which a bucket is to perform is important in its design and construction since, at greater depths, it is the proportion and balance of total weight that determines how well a bucket works. The dragline's power or capacity is naturally the limiting factor on the size or weight of the bucket. A bucket that weighs too much slows the cycle, increases the wear and tear on the machine and reduces production. By the same token, a bucket that is not matched to a dragline's capacity is wasting the machine's power and productive capacity.

BUCKET PERFORMANCE: Four Characteristics the Keys

The basic function of a bucket is to remove material. More importantly, the bucket must remove material at maximum rate with minimum power consumption and minimum bucket and machine maintenance. This involves four basic characteristics:

1. Full rated capacity.
2. Immediate digging ability.
3. Fast, full loading.
4. Durability.

FULL RATED CAPACITY

The true, full "carry-out" capacity of a bucket is not always clear because there are several ways of rating bucket capacity. Nevertheless, "carry-out" capacity plays an important part in the amount of material handled. Many buckets are rated on "gross displacement," which is determined by multiplying length, width and height, as in Fig. 1. It is an easy way to approximate but does not provide exact bucket "carry-out." In contrast, Fig. 2 illustrates the most accurate method of gaging rated capacity. Since most buckets have a curved back which reduces their capacity, and also because loose material will not stand perpendicular to the lip when hoisted, but instead assumes a slope or angle, two losses must be deducted. Unless these losses are taken into account, actual bucket performance will be less than might be expected.

IMMEDIATE DIGGING ABILITY

The ease and rapidity with which a bucket digs in and fills, and its ability to dig in the most economical position, are its two most important features, and are reflected immediately in the profit and loss column. The quicker a bucket digs in and fills, the less time required to complete a digging cycle. Fig. 3 shows the path taken by a bucket when viewed from above, and Fig. 4 shows the increased volume obtained by reducing cycle time.

Hoist, swing and return are machine functions and are not affected by the bucket. Bucket performance, however, does affect the complete time for the cycle. For example, assume that a full cycle takes 50 sec, of which 14 are spent loading. This means 72 cycles per hour. A bucket having greater digging ability can fill faster and thus cut down the loading time, by say 8 sec, or a saving of 6 sec per cycle. While 6 sec may not seem impressive, cycles per hour are raised to 81.8, an increase of 9.8 at the end of 8 hr. The machine has completed 78.4 additional cycles, and has done the equivalent of 9 hr work, compared to production at 72 cycles per hour bucket. You can readily see the importance of this in dollars and cents when you look at the increased yardage and the reduction in time required to uncover the coal.

Ability of a bucket to dig directly under the boom is one key to big yardage, since the more nearly the cycle of operation approaches that of a grab bucket, the better the production. If it is necessary to drag the bucket to the fairlead before filling, lost time occurs. Every foot of loadline that is hauled in has to be let out before the bucket can be dumped. Also, loading and hoisting close to the fairlead greatly increases the strain on the load brake, and picking up a bucket close to the fairlead throws a tremendous strain on the boom, which may tend to buckle it.

Early Pickup Greatly Increases Production—It is vital to pick up the bucket early in the stroke and as near under the boom as possible. To make this possible the bucket must be designed and balanced so that when pull is applied to the hoist line the front end of the bucket comes up first. If the back comes up first, there is excessive spillage and early pickup is virtually impossible. Recent studies have disclosed that there is a definite relation between the length of the hoist chains, the distance the block extends out over the arch, and ability to hoist a bucket directly under the boom without spillage. A feature of the automatic bucket contributing significantly to early pickup is the location of its arch, which extends out in front of the bucket and thus increases leverage.

Basic design and engineering are what make one bucket dig in and fill faster than another. Good bucket design reflects many, many things but probably the most important is balance. Some buckets, in starting from a flat position, literally slide along until the teeth hit a soft spot, obstruction or snag. Others rock up on their teeth, and rake or chatter across the surface before digging in. Still others, once they start to dig, keep right on until they bury themselves, requiring troublesome jockeying to break them loose and putting a considerable strain on the hoisting mechanism. Fig. 5 shows the excellent digging and filling action of a perfect bucket.

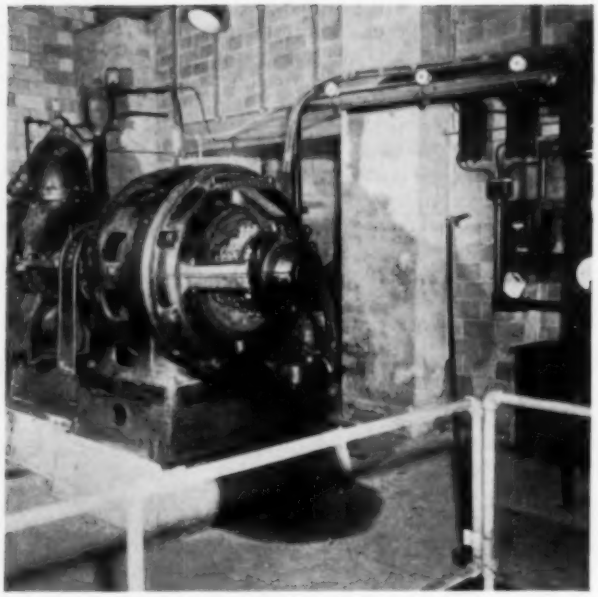
FAST, FULL LOADING

The loading characteristics of a bucket can be either a detriment or an asset. Very often it's that "something extra" that makes a real champion, producing full loads consistently. Here again, design and manufacturing know-how play very important roles. Bucket design based on having material flow up and over tend to result in an unfilled space in the upper rear. To obtain a full load, it is better to have the material crowd under, pushing the material already in to the top of the bucket. This type of loading action completely fills the bucket, including the rear curve, which in some instances is hidden from the operator.

DURABILITY

Ruggedness and the ability to withstand punishment are musts for a good working bucket. Without these qualities, any bucket, no matter how well it produces, will not pay off in a long, economical run. All component parts are important in construction, while the body, arch, lip, teeth, block, hitch plates, lip shrouds, wear plates and bottom shoes should have special consideration.

BIGGER POWER BILLS are the rule at today's mines where underground substations frequently run to 500-kw.



AUTOMATIC PUMPING in off-peak periods reduces peak demand. Time-clock controls prevent over-operation.

Cutting Power Bills

Dig into your power bill for a better understanding of what demand, energy, power-factor and fuel-adjustment charges are. Then look over your operation for ways to keep it down.

HAVE YOU EVER stopped to consider what it costs to supply power to all the equipment at your property? Although everybody agrees that it takes a great deal of electricity to operate today's modern mines and preparation plants, not everybody stops to consider how much—and how much the total consumption and total cost might be cut with a little thought and effort and the right equipment.

If yours is a typical company, chances are that few people see the monthly power bills. They probably come into the accounting department, are sent to the engineering department or mine superintendent to see if the meter readings check, and then are returned to the accounting department. Simply because it's a regular thing, and "it takes electricity to mine coal," the attitude sometimes is: "It's a bill we have to pay each month, so why worry?"

But that's a shortsighted attitude today. Power bills are constantly growing because of the increased power required by the new higher-capacity machines, particularly continuous miners. Mines that once found 150- to 200-kw substations ample now are using 400- to 500-kw units, and more of them. And power bills have increased correspondingly.

Since the power is used mainly in the production and preparation of coal, the power bill should be the concern of many officials in the operating and engineering departments. But that can happen only if they understand a power bill, how it is calculated and how they can help reduce it.

WHAT'S IN A POWER BILL

Each power company has its own rate structure and method of calculating its bills subject to public service commissions in the various states. In general, power bills include the following four charges:

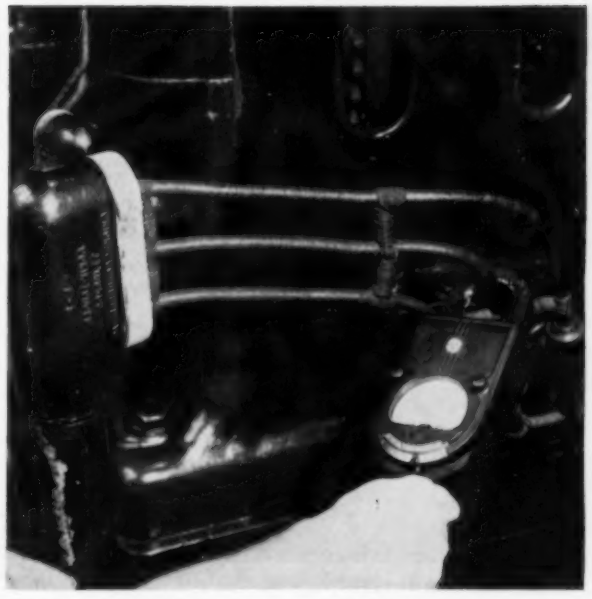
1. Demand charge. Demand is the largest quantity of electricity used in a specified period, usually 15 to 30 min depending on the contract with the power company, for the month that is being billed. This high reading is known as the maximum demand and is the basis for establishing the demand charge item in the monthly bill. It is to the customer's advantage to keep this demand charge as low as possible. The demand billing on your bill is not necessarily the same as the indicated 15- or 30-min demand. For instance, power factor can affect the billing either favorably or unfavorably. Examples of how this works are illustrated later in the text.

2. Power-factor charge. Power-factor clauses are included in most power contracts and can result in a penalty charge on your power bill. The power company sets up a minimum power-factor figure that is to be maintained by the mine at all times. This may be measured on the main meters or may be spot checked once or twice a year.

Assume that the power company requires 85% power factor at your mine, which is a common figure. As long as your power system operates at, or above, that figure you don't have to worry. If you fall below it, penalties will be added and your power bill will be more than it should be. On the other hand, many power companies offer premiums for good power factor.

Here's how they figure premiums

POWER-FACTOR CORRECTION achieved with properly installed capacitors will help get more from your dollar.



HOOK-ON METER permits maintenance men to check power consumption in a matter of seconds.

and penalties. Assume that your mine demand is 1,000 kw and the power company requires 85% power factor. Meter readings show that your plant is operating at 90% power factor. The demand billing in that case will be 1,000 kw × $^{85}/_{90}$, or 944 kw. At $1.30 per kw, you save $72.80 at 90% power factor.

Suppose your power factor falls to 70%. Then the power demand billed will be 1,000 kw × $^{85}/_{70}$, or 1,215 kw. At $1.30 per kw, your bill climbs to $279.50 more than it would be at 85%. That's a sizable increase.

3. Energy charge. That is the part of your bill that represents the actual power used. It's metered and you pay for what the meter shows.

4. Fuel - adjustment charge. Most power companies now include this item in bills. It is based on the cost of fuel to the power company and is included to take care of the rise or fall in the price of fuel. This item eliminates the need for a new rate schedule every time fuel prices change.

WHAT A POWER BILL LOOKS LIKE

Let's look at a typical power bill and see how it is influenced by the various components described. A typical bill would look something like this:

Month	September
No. of days	30
Power factor	85%
Demand (kw)	3,300
Energy (kwh)	1,221,000
Demand Charges	
2,000 kw @ $1.30	$2,600
All additional @ $1.20	1,560
Total demand charges	4,160
Energy Charges	
1,000,000 kwh @ 0.7¢	7,000
221,000 kwh @ 0.4¢	884
Total energy charge	7,884
Grand total	$12,044

One main road to cutting power bills is to reduce your billing demand. This doesn't mean using less power but using it more evenly. You can reduce demand billing in the following ways: (1) indirectly by improving power factor; and (2) directly by reducing your maximum demand. You also can make significant savings by reducing your energy charge.

IMPROVING POWER FACTOR

If your power contract contains a power-factor clause, there are several things you can do:

1. You can buy capacitors that will improve the power factor. Representatives of electrical equipment manufacturers will be glad to show what's needed at your plant. In general, capacitors should be placed close to the load to get the greatest benefit from them. At most plants a bank of suitable units can be located close to a group of motors.

2. You can buy synchronous motors that have 80% corrective characteristics. These will do the same job as capacitors but they usually come in the larger size units, 100 hp and up. However, there are few motors of this size around most coal plants, and therefore the synchronous units have a somewhat limited application. Some possibilities for effective use include drives for fans, large crushers and other large units.

3. You can concentrate on removing the causes for poor power factor in your operations. The biggest element in poor power factor is AC motors that are not fully loaded. Feel some of your motors the next time you are in the preparation plant. If they are not hot, chances are they are not running at anything near full load. These usually are induction motors, so the closer they run to full load, the better the power factor. Have your chief electrician take some load tests with instruments to determine which units are consistently underloaded. For example, if you have a 10-hp motor consistently doing a 5-hp job, it's probably time to swap. It is impossible to have motors operating at full load in all instances, but they should be running somewhere near top capacity.

PREMIUMS AND PENALTIES

To illustrate what happens to a power bill containing both premium and penalty clauses when the power factor is improved, let's assume that the power factor in the illustrated bill was 70% instead of 85%.

The demand billing then would be 3,300 × $^{85}/_{70}$ or 4,007 kw and the charges would increase correspond-

ADEQUATE EQUIPMENT for testing and trouble shooting is essential in getting more from your power dollar.

COMPLETE information motor performance is easily obtained by using an analyzer like this and recording data.

ingly. The increase of 707 kw in demand billing would be charged at $1.20 per kw and would add $848.40 to your monthly bill.

If the power factor is improved over the 85% value, there will be a saving over the first bill illustrated. Here is how it works:

The billing demand is $3,300 \times \frac{85}{90}$ or 3,116.7 kw. The decrease of 183.3 kw is figured at $1.20 per kw and adds up to $219.96. In all three illustrations the same work is being done but the power cost is different.

REDUCING POWER DEMAND

In the preceding calculations, the demand billing was changed by power factor improvement. That was an indirect method and to further reduce costs direct methods should be investigated. Let's see what happens when the demand is decreased to 3,000 kw. In the sample bill there would be a saving of 300 kw @ $1.20 or $360.

How do you go about reducing the maximum demand? An examination of the demand chart will show when the peak demand occurred. Follow this with a close analysis of equipment, including when and where it is used. A convenient method is to set up a table including such items as type of equipment, size of motor on each piece of equipment, average loading, duration and time of average loading, duration and time of peak loading. With this information before you in chart form, see if there is any practical way of decreasing demand by spreading starting periods for major units or by changing some load from high-peak periods to off-peak periods. Some equipment must be kept running at regular hours to produce coal. This takes a definite quantity of power for the entire shift. It would be foolish to run these machines intermittently solely to reduce the peak power demand.

Such things as rescheduling haulage so all large locomotives are not working under full load at the same time also helps. Another possibility is shorter and more frequent trips with the locomotives to keep power requirements lower. This procedure may require the adding of more crews and locomotives and this then must be weighed against the savings in power.

Another opportunity for reducing power demand lies in keeping haulage grades to a minimum. It takes much more power to haul coal up a 3% grade than on level track or on a 1% slope. Money spent on well-graded track pays off not only in lower power consumption but also in faster haulage.

Off-shift pumping, off-peak welding and starting the preparation plant before or after the mine also should not be overlooked when attempting to reduce the demand.

CUTTING POWER WASTE

How much power is simply wasted around your operation? This shows up in the energy charge and will cost you double if there is an upward adjustment in the fuel charge.

One simple method of cutting waste is turning off lights when they aren't needed. With so many lights around today's modern plants and shops, workers sometimes get careless and leave lights burning, or depend on the other man to turn them off. As a result, nobody turns them off and the meter goes merrily on its way.

Float-switch control of pumps can go a long way toward eliminating unnecessary running of pumps after water has been removed and nobody is close by to stop the unit. The power needed to drive a pump also is directly affected by the head it is pumping against. Therefore anything that will decrease the head will decrease the power needs. If the coal seam is above drainage, the pumping head sometimes can be reduced by drilling horizontal boreholes or making small openings to the crop. Sometimes one or more pumps can be eliminated by making these openings.

The power required for ventilation can be reduced by providing enough cross-section area both in air shafts and underground openings. One-way air travel in shafts, and well-built stoppings, free of leaks, are other ways to cut the power needed for ventilation. Operating mine fans at half speed on idle days is another possibility worth checking. However, before this is done a thorough study should be made to assure that half-speed operation will supply a sufficient volume to deliver satisfactory air to all areas of the mine.

The next time your power bill comes, take a close look at it, note the various components. Then get busy and see if you can't save some money by reducing each item as much as possible. The result may be surprising and satisfying.

ABC...and the Reader

BACK IN 1914—forty-one years ago—a group of advertisers, advertising agencies and publishers joined in a project that has come to mean a great deal to the millions who, like you, read business magazines. The project, initiated at a time when circulation claims were rarely verified, was intended to achieve and maintain higher standards of integrity in publishing and advertising practice by providing means to audit paid circulation. Out of that effort came an organization known as the Audit Bureau of Circulations, a voluntary, non-profit, cooperative association, known for short as ABC. Its symbol appears at the head of this page.

We are proud that McGraw-Hill publications were among the founders and charter members of the Audit Bureau of Circulations.

Today the Bureau numbers 3,670 members. These include advertisers, agencies, and publishers of newspapers, farm papers, general magazines and business journals such as this one. These publisher members hold their memberships and their right to display the ABC symbol in their publications only so long as they live up to the circulation standards that are established through the Bureau.

It is one thing to set up high standards; it is another to see that those standards are maintained. This latter and all-important function is performed by a staff of auditors maintained by ABC to check periodically on the circulation practices of the publisher members. When a business magazine, such as this one, joins the Bureau it agrees that the ABC auditors shall have "the right of access to all books and records." Their inspection may dig into the files of original subscription orders, payments from subscribers, paper purchases, postal receipts, arrears of payments, editorial expenses and many other significant items. Sometimes the auditors go behind the records and seek verification of purchase and payment from subscribers themselves.

The information thus obtained and certified by the Bureau then becomes available to the public and constitutes an authoritative report on the publication's circulation practices.

The advertisers and agencies benefit directly from the ABC because it provides a generally recognized factual yardstick by which the circulations of member publications can be measured and appraised. Every paragraph in an ABC report on a business publication gives the advertisers data that help them make intelligent use of the publication as an advertising medium.

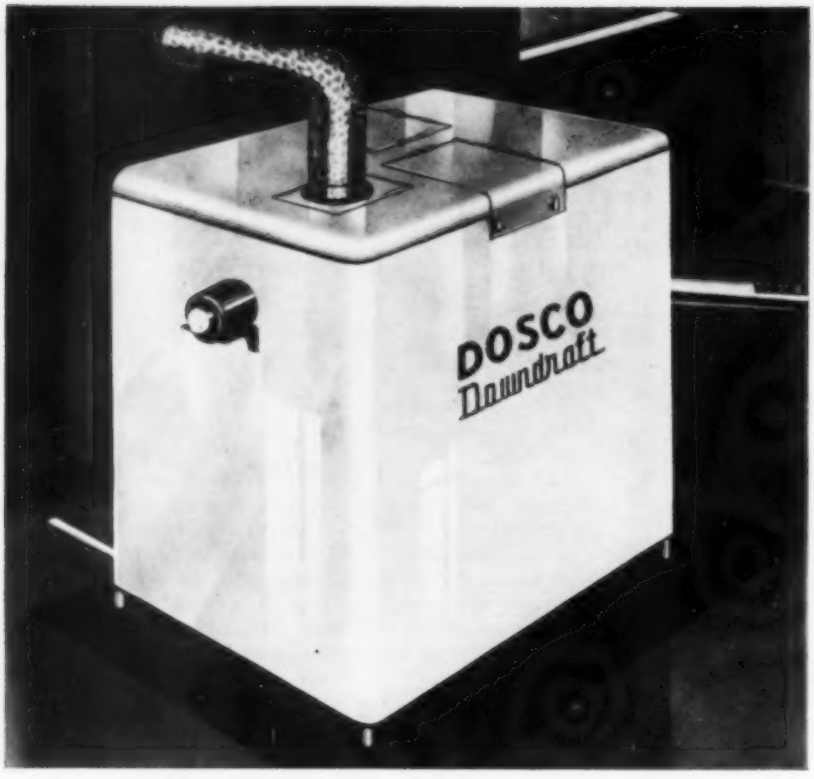
But the ABC renders a service of vital concern to the *reader* as well. The Bureau audits paid circulation only, and it is through this payment, whether by subscription or newsstand purchase, that the reader keeps the editorial policy of a publication responsive to his needs. His decision to buy or not to buy records his judgment on each publication, and the ABC-audited and certified circulation reports make the sum of these judgments known to all concerned.

So the editors of ABC publications must constantly keep their editorial services up to the mark if they are to survive a competition in which the reader's right to buy or not to buy is paramount. Each paid magazine or newspaper will prosper or fail as it wins or loses the voluntary patronage of thousands or millions of readers. And—the ABC is scorekeeper in this vital contest.

Thus the publisher who submits his publication to the supervision and discipline of ABC affirms in the strongest possible manner his recognition that his primary obligation is to his readers and that he owes the standing of his publication to a voluntary demand by those readers.

All this is what makes the ABC brand on a publication so important to its readers. That respected symbol, testifying to the advertising value of the publication, serves also as a constant reminder to all concerned that the reader's willingness to pay for an ABC publication is the basic reason why it stays in business.

McGraw-Hill Publishing Company, Inc.



New "spoon-fed" furnace, based on BCR principle and perfected by Dominion Steel & Coal Corp., Ltd., gives the home owner a bargain in automatic heating and convenience, along with a unit he can take pride in owning.

PRIDE OF THE FURNACE ROOM is this unit jacketed in gleaming porcelain. Small in size and highly efficient, it can keep a 10- to 12-room house comfortable all the time in northern latitudes.

Dosco Fights Oil With New Downdraft Furnace

"THE FURNACE THAT IS SPOON-FED. It's a fact. With Dosco's sensational new furnace coal is fed automatically in such minute quantities that it is virtually spoon-fed. In fact, ¾ lb of coal will hold fire in the furnace for 1 hr. This is the new, compact, gleaming-white metal furnace that disposes of its own ashes and leaves the furnace room immaculate.

"Check these features:

"**Convenience** – Unsurpassed for comfort and convenience.

"**Economy** – Cuts a minimum of 20% from the cost of operating a hand-fired furnace, with relatively higher savings over other-type heating systems. Cost of purchase and installation is less than for any other self-feeding heating system.

"**Cleanliness**–It is impossible for dust or ashes to enter the furnace room. There is only a very small amount of ash and it is removed by vacuum as it forms.

"**Fully Automatic** – This furnace stokes itself automatically as required by the theromstat and even removes its own ashes.

"**Compact**–The new Dosco furnace is the most compact furnace you can own. It measures 40 in long by 30 in wide and 48 in high."

ANSWER TO OIL: Equal Convenience, Lower Cost

With a final "Pays for itself as you use it," this was the text of a quarter-page ad that greeted residents of Halifax, Nova Scotia, and environs in the Halifax *Chronicle-Herald* July 11. Signed by the Dominion Steel & Coal Corp., Ltd., this ad was a further step in Dosco's campaign to introduce its new "Downdraft" furnace to home owners in the Maritime Provinces and elsewhere in Canada. This campaign got under way early in 1955, and represents the fruition of a program embarked on several years previously when it became apparent that oil was preparing to invade the home-heating market in the area.

This program it was recognized, would have to be based on a low-cost coal-burning unit which would have to be compact, safe, efficient, clean and automatic. Ideas considered included the downdraft principle developed by Bituminous Coal Research, Inc., of which the coal companies controlled by Dosco are members. It stood the test of comparison with all other possible ideas for home heating, and Dosco therefore decided to convert it into a commercial unit. Production is being handled by the Eastern Car Co., Ltd., a Dosco affiliate, and sales by a separate organization established by the Dominion Coal Co., Ltd., of Sydney, N. S. Installation of the first units was scheduled for fall this year.

BURNING PRINCIPLE: Downdraft, Automatic Control

As perfected by the engineers of the Dominion Coal Co., the Down-

draft furnace is now arranged as shown in the accompanying cutaway view.

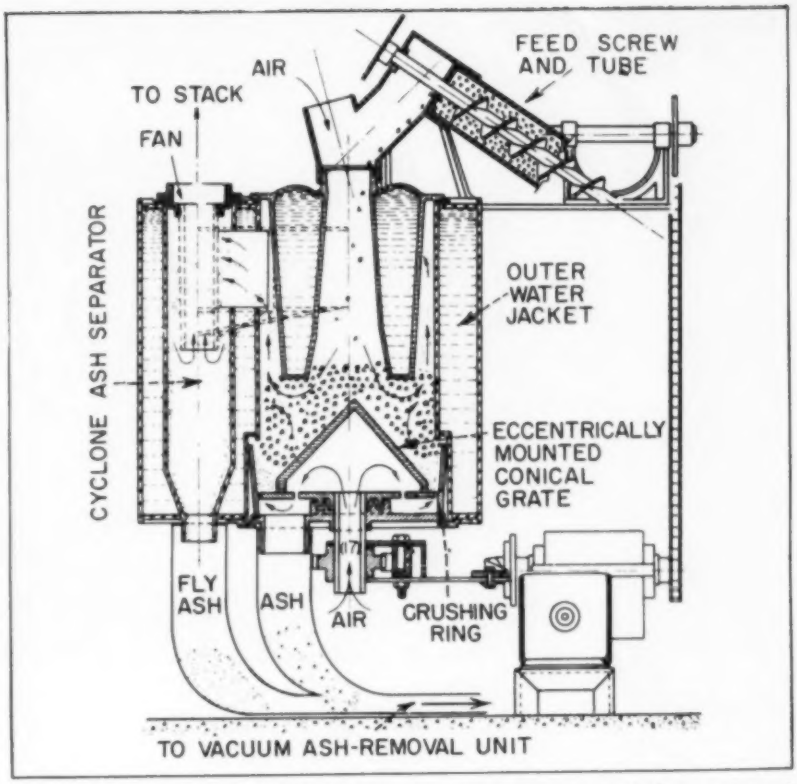
Stoker coal (¼x¾ or other stoker size) is brought from the bin to the feed and draft tube at the top of a screw conveyor. An incidental advantage of this construction is that if the screw is jammed it can be easily removed by pulling it out the top. The same motor rotates the conical grate on which the coal is burned. The plate carrying the cone is slightly off-center, and the lower part of the combustion chamber incorporates a crushing ring. Thus, as the grate revolves any clinker is automatically broken to pea size and falls through a slot in the base plate with the ashes going to the disposal equipment below.

The primary furnace control is the home thermostat. Secondary controls include a hold-fire timer and an aquastat. When the thermostat calls for heat, the induced-draft fan with which the unit is provided is started up to increase the burning rate. The air for combustion enters through one leg of the Y-inlet to the feed tube at the top of the furnace. As the coal burns, its level drops below the inlet inside the furnace, permitting more air to flow and creating more suction pressure at the top of the inlet, from which a rubber tube extends to a "pressure differential control." This is the heart of the automatic feeding system. When the suction becomes strong enough, this control starts the feed-screw motor and coal is dropped piece by piece through the feed tube onto the fire. As the level of the fuel bed is built up to the central water ring, or inner heat exchanger, the suction pressure decreases and the pressure differential control shuts down the feed-screw motor. The induced-draft fan continues in operation until shut down by the thermostat or aquastat.

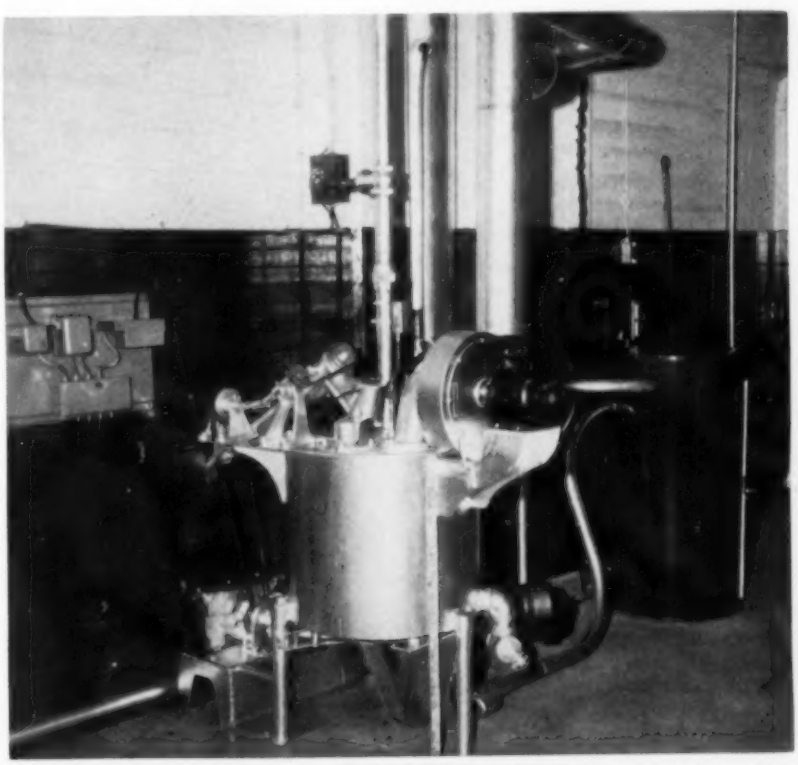
Secondary air, as indicated, is introduced through the hollow shaft of the grate drive. Exhaust gases are pulled into a cyclone-type separator for removal of the flyash before passing through the induced-draft fan to the chimney. The flyash drops through its own discharge opening to the ash-disposal system.

ASH DISPOSAL: Timed Vacuum to Sealed Can

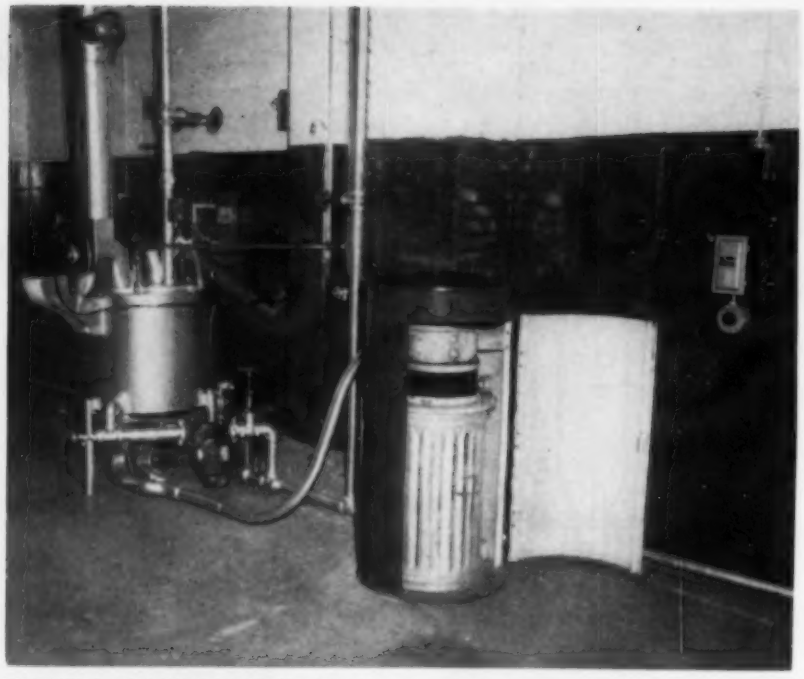
The ash-disposal system accompanying the Dosco furnace is designed for installation either in the furnace room or at some convenient point outside. A vacuum fan similar to a vacuum-cleaner unit pulls both ashes and fly ash through a 2-in pipe to the top of an ash-can container. As the ac-



TOP FEEDING AND DOWNDRAFT, with offset grate to grind up ash and cyclone separator ahead of induced-draft fan are among Dosco furnace features.



TEST UNIT without jacket is just 3 ft high. On wall at left is control panel including pressure-differential switch. Motor driving grate and feed screw is at bottom left of furnace, with induced-draft fan at top right. Ashes go out through vacuum disposal (right) that is vented to chimney to keep gases out of house.



VACUUM ASH-DISPOSAL UNIT, shown with door open, receives both regular and flyash from bottom of furnace and deposits it in can through seal at top.

VACUUM MECHANISM is mounted in top of ash-disposal unit (left). To remove can, seal mounted on bottom of rubber ring is lifted by ball on rim.

companying photos show, the ash can is set in the bottom of the container, and is sealed by a ring and flexible rubber sleeve. To remove or replace a can, the seal ring is unclamped and lifted up as shown. A 2-in pipe from the ash collector is connected into the chimney to vent any combustion gases that may be drawn into the collector during the ash-removal process. Thus, there is no opportunity for such gases to enter the furnace room or, if the unit is outside, the house through windows or other openings.

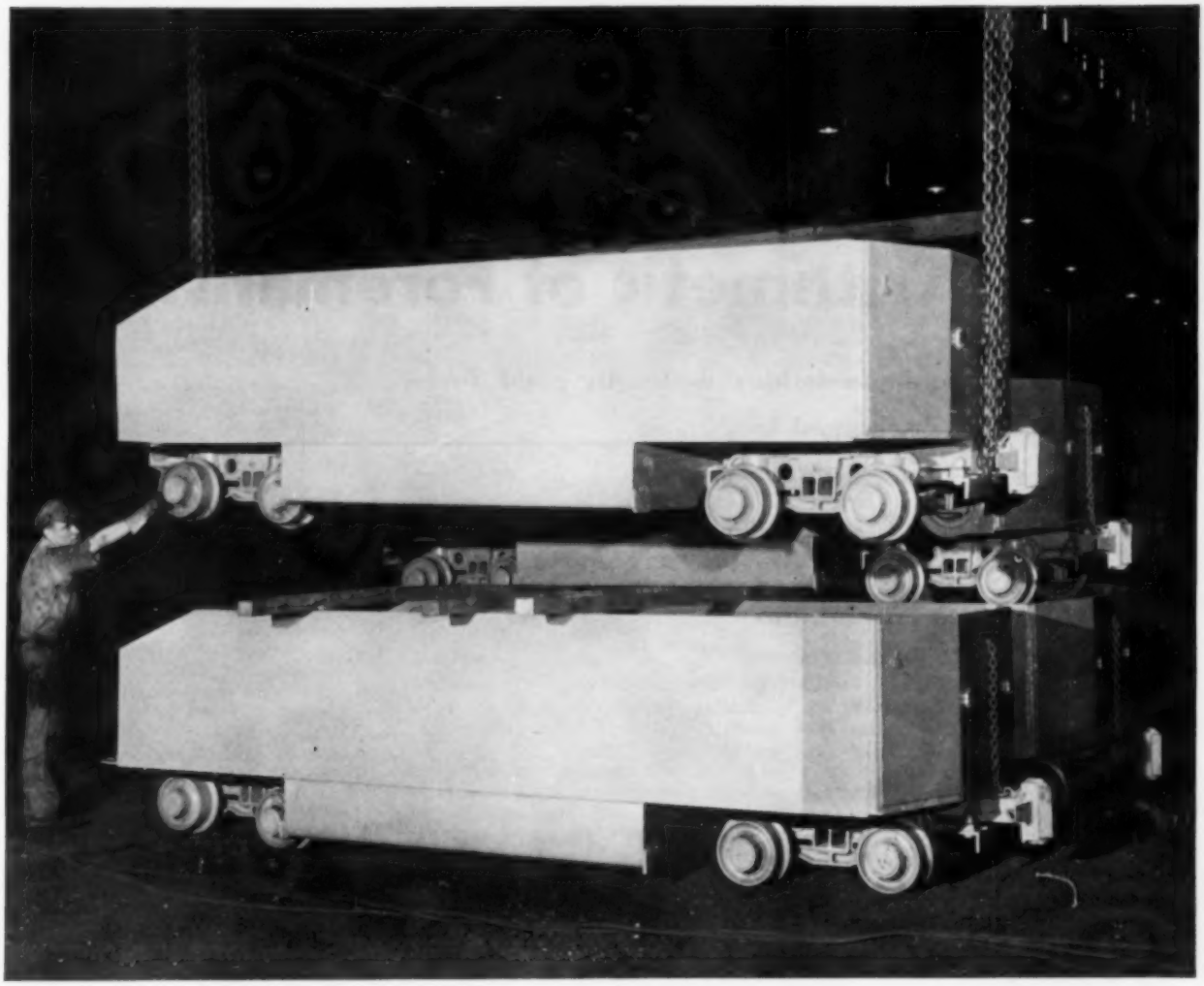
A timer starts the vacuum ash-removal fan at predetermined intervals—usually every 2 or 3 hr. The fan operating period normally is 60 sec. Where normal ash contents prevail, one can has held the product of a month's operation at near-zero weather, reflecting the fact, among other things, that burning efficiency is high.

OWNER PLUS: Low Cost for Installation

Since Dosco's idea is to preserve its home-heating market, it will sell the new furnace and ash-disposal unit at cost. This works out to $715 for the standard home unit fully jacketed in porcelain, plus cost of installation. Under test for 1½ yr, this unit, in the standard, or middle, size has shown that it can easily heat a 10- to 12-room house under Nova Scotia conditions. Normal efficiency in the smallest size is close to that achieved in test periods, or 70.1%, equivalent to 435 ft EDR. The coal-burning rate was 93,290 Btu per hour. The middle-sized unit burned 104,200 Btu per hour with an efficiency of 67.7% and a rating of 695 ft EDR. The largest unit, presently under test, will have a similar efficiency and a rating of approximately 1,500 ft EDR. The fire can be held nicely at a feed rate of ¾ to ⅞ lb per hour.

Plans call for offering a smaller unit in addition to the larger, and for a warm-air model. The smaller, or lower-rated, model probably will be the standard unit with a smaller induced-draft fan, since making patterns and setting up for a physically smaller unit would be excessively costly. The larger unit—an actual scaling up of the standard—would have a capacity sufficient to operate a store, small office building or other similar commercial establishment.

Installation of the Dosco furnaces in homes will, as noted, start in the fall of this year. These sales reflect not only advertising but a whirlwind program involving personal appearances and demonstrations of the unit to the public in most of the major Nova Scotia cities and towns.



These Cars Will Move the Tonnage Fast

The customer who ordered these 10-ton cars operates a high-production bituminous mine. He discussed his needs at length with Bethlehem engineers, and a thoroughly modern design was worked out. Several features of this design are apparent in the photograph above, which was taken in the Bethlehem shops.

The four cars shown are typical of the entire fleet. They have all-steel, all-welded bodies that will take a brutal pounding. They have sturdy forged wheels and cast-steel trucks with heavy springs. Couplers are automatic, of course.

This is a type of car that will move the tonnage fast. The design has been streamlined without loss of capacity. It is an excellent choice for many present-day haulage systems. However, if your requirements run to other designs, Bethlehem is fully geared to build them for you. We are equipped to produce both end-dump and rotary-dump models with welded or riveted bodies, and with high sides or low sides, whichever you prefer.

Call or write whenever we can be of service to you. Bethlehem technicians will gladly sit down with your staff and render all possible assistance.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

FOREMEN'S FORUM

The Arithmetic of Foremanship

How the human-relations duties in good foremanship can be discharged by . . .

Adding to Experience

Subtracting Interferences

Multiplying Abilities

Dividing Responsibilities

AT THE RISK OF OVERSIMPLIFICATION, but in the hope of clarifying the bounds of foremanship, we offer the thought that supervision consists of applying the four fundamental operations of arithmetic to the human relationships concerned. As you know, the four fundamental operations are addition, subtraction, multiplication and division. All others, if there are any, are based upon these four.

In your contact with others, what is added? What is or should be subtracted? What should be multiplied—and what divided?

The good foreman seeks to add to assimilated experience, both his own and that of his men. He strives to subtract or eliminate interference and friction in all personal relationships with his men and other supervisors. His aim is to multiply the abilities of himself and his men, and to divide properly the numerous responsibilities imposed by the job.

Now for the ABC's, or rather the 1, 2, 3's, of handling the arithmetic of foremanship. Take the operations one at a time.

ADDING EXPERIENCE

A good foreman's first desire is to make definite progress in bringing jobs to successful ends. He wants to handle each job with a little more finesse and with greater dispatch than he showed on the previous job. That is how experience accumulates, learning which actions to take and which to avoid while doing every single job, thus improving one's performance the next time around on the same kind of job.

One of the first lessons to be learned, however, is that the foreman's performance depends to a great extent upon the experience of his men. He blindly limits his own achievement if he greedily builds up his own experience while failing to develop the same growth in experience among the men in his crew.

Adding experience, therefore, is a matter of two-way training. The process includes the following:

1. The good foreman takes to any sort of supervisory training like a duck takes to water. He participates with interest in conferences on safety, human relations, mining methods or whatever. He reads a lot; there is so much to learn. He gets real pleasure out of learning as much as he can about bearings, or lubricants, or drill bits, for example.

2. The good foreman is zealous in promoting training among his men. He keeps them informed of the training opportunities available to them. Then he helps keep their interest up by discussing their progress with them while they are in training.

3. He goes out of his way to instruct his men on the job. If he is nearby while a machine is being lubricated he makes conversation with the greaser about the importance of clean lubricants, the necessity of servicing every lube point and so on. The ability to move into these situations and take charge is a mark of the self-assured foreman.

4. He passes his own tested knowledge along to the men in his crew who need it in their work. In that way, the foreman and the men grow together in experience to the everlasting benefit of the job.

Don't be the kind of guy who keeps all he knows to himself in fear that someone may supplant him. In looking to the future, consider the fact that today's young blades are not knocking down the doors to get into mining careers. The young engineers coming into the industry are top-notchers, but there is a question as to whether there are enough of them. Your opportunities for progress are broad if you continue to take the training that will permit you to capitalize on them.

A promotion for you, however, may depend upon whether a qualified man is available to take your place. Be sure the best man in your crew has the necessary papers and ability to take over your job. You can do this without making any loud promises. Just keep pushing the fellow. If you can suggest your own replacement, and the suggestion is accepted by your superiors, you have given the first sure indication that you are ready for the next bigger job.

SUBTRACTING INTERFERENCES

The two main interferences confronting you are (1) personal friction between yourself and one or more members of the crew and (2) equipment outages. The messy business of grievance-handling has been written to death, perhaps, but you still can't dodge your responsibilities for taking sincere steps to clear up all complaints, or for taking a solid stand on your

Telling on Yourself

You tell on yourself by the friends you seek; by the very manner in which you speak; by the way you employ your leisure time; by the use you make of dollar and dime.

You tell what you are by the things you wear; by the spirit in which your burdens you bear; by the kind of things at which you laugh; by the records you play on the phonograph.

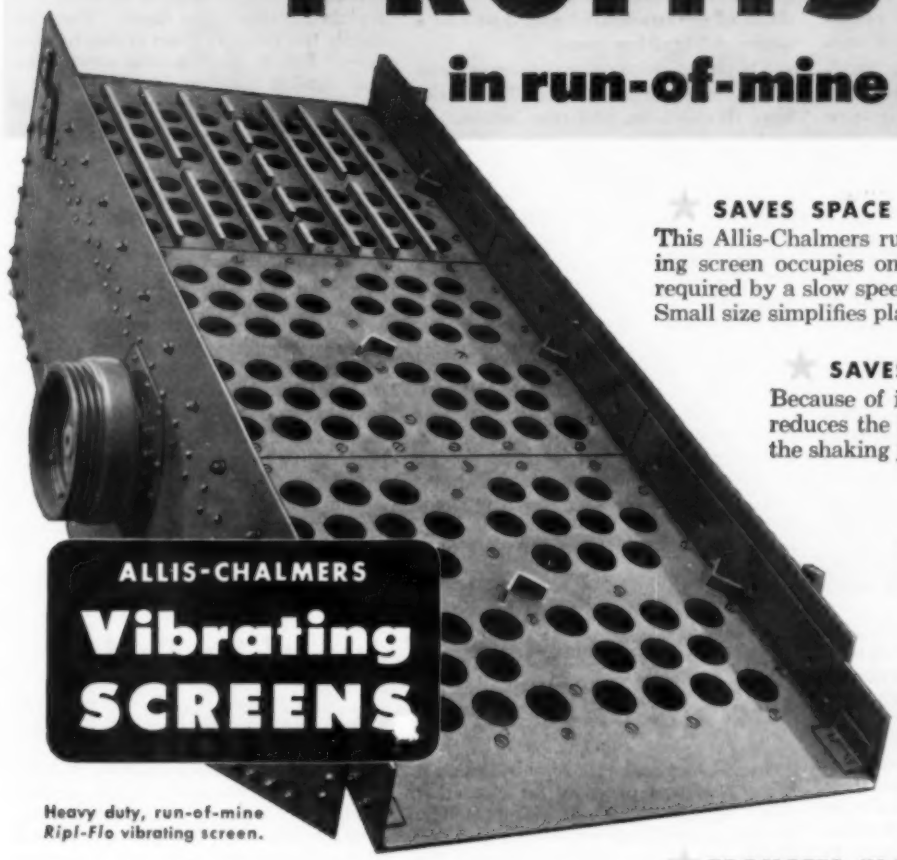
You tell what you are by the way you walk; by the things of which you delight to talk; by the manner in which you bear defeat; by so simple a thing as how you eat.

By the books you choose from a well-filled shelf—in these ways, and more, you tell on yourself. So there's really no particle of sense in an effort to keep up false pretense.

—Author unknown (Reprinted from Union Pacific Coal Co. *Safety Review*)

SAVINGS that build PROFITS

in run-of-mine scalping



Heavy duty, run-of-mine *Ripl-Flo* vibrating screen.

For complete information, see your nearby A-C representative or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Bulletin 07B7868.

SAVES SPACE

This Allis-Chalmers run-of-mine *Ripl-Flo* vibrating screen occupies only a fraction of the space required by a slow speed shaker of equal capacity. Small size simplifies plant layout and saves space.

SAVES HORSEPOWER

Because of its smaller size, this screen reduces the horsepower required to do the shaking job by approximately 50%.

SAVES MAINTENANCE

The heavy duty run-of-mine *Ripl-Flo* screen has a simplified two-bearing construction. Fewer parts mean fewer replacements and less time out for repairs. Oil-lubricated mechanism requires little attention. Your production time is increased . . . your maintenance time is reduced.

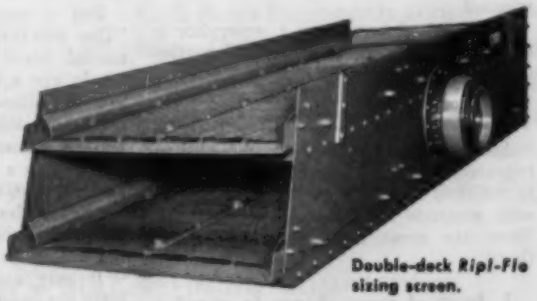
PROMOTES PLANT EFFICIENCY, TOO

Recovery of egg, nut, stove, and stoker sizes can be increased as much as 4% when these heavy duty screens are used to remove 7x0, 6x0 and 5x0 coal ahead of rotary breakers.

Egg, Nut, Stove, and Stoker Sizing

The wide range of standard heavy duty *Ripl-Flo* vibrating screen sizes meets every sizing application. These screens can also be supplied with *Sta-Kleen* decks and electrically heated decks for screening fine moist coal.

An A-C Screen for Every Phase of Coal Preparation — scalping and dry sizing, wet sizing and dewatering. A-C screens are applied following such equipment as jigs, sand cones, chloride washers. They're used in heavy density plants for pre-wetting and media recovery, as filter screens for recovery of fines and water clarification.



Double-deck *Ripl-Flo* sizing screen.

Ripl-Flo and *Sta-Kleen* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-4662

Forecast: Cold, Dry, Dangerous

OLD MAN WINTER is champing at the bit, straining to bring in the icy blasts. It's going to be real cold.

Worse than that, it's going to be real dry — underground. You can see the change now. The droplets have dried from the roof already, and each day the mine grows drier, and drier, and drier.

Buck up your rockdusting procedures. Make sure you have a good supply of the white lifesaver on hand. Inspect your rockdusting machines, overhaul them if you can, buy new ones if you can't bring the old ones into top operating condition economically.

Run a strict dust survey all through the mine, paying special attention to seldom-traveled openings. Neglecting this important responsibility right now may have serious consequences if a cloud of dry, undiluted coal dust and a source of ignition react.

This is primarily a management and supervisory responsibility. Now's the time to check up and take action.

best principles when the occasion demands.

In approaching the matter of grievances don't let your thinking become misdirected. Worrying about how to handle the next flare-up is a negative approach. The positive way is to take intelligent concern in heading off the next one.

Though this may sound rather trite, we'll not apologize for it. The most striking traits of the boss who runs a serene job are bigness, patience and sincerity. He is big enough to shrug off or understand the frictions which may arise, patient enough to get to the root of each complaint and sincere enough to follow through to a hard-and-fast decision.

Turning to equipment outages, we note that some of these have a basis in human failings. The loading machine may take a beating because the operator is throwing a temper tantrum. Trailing cables may receive scandalous treatment because the men just don't realize their value. The obvious way to subtract these interferences is through patient instruction and having the good sense to stop machine abuse by providing a conversational breathing spell. And when you've reached the limit of your patience, and you're about ready to blow a gasket, don't count ten. Just ask the man a question. It will keep you from blowing your top while you compose yourself.

A display of temper in a supervisor is a spectacle hard to forget for all parties concerned.

MULTIPLYING ABILITIES

Multiplication is nothing more than repeated addition. One of the best ways to multiply ability is to share experience with someone else, as often as possible. Here are some suggestions for doing that:

1. Jump at every chance to attend a technical meeting. The papers and discussions are distilled from the proven experiences of the speakers and their colleagues back at the mine. Listen attentively; they have a lot to tell you.

2. Make a regular habit of reading your favorite mining magazine—*Coal Age*. This is a more or less painless way of broadening your knowledge, thus increasing your ability.

3. Remember to bring your men up with you. If local agreements permit, use a rotation system for lunch breaks to permit training of stand-in operators on all machines. In other words, multiply their abilities, too.

Mark your progress and that of your crew periodically. Have you acquired any new supervisory talents or greater proficiency in any of your regular duties in the past 6 mo? Can you now count on a competent replacement if the loading-machine operator is off sick tomorrow? You can answer both questions in the affirmative if you have given some attention to multiplying abilities.

DIVIDING RESPONSIBILITIES

On the matter of dividing responsibilities we hark you back to Foremen's Forum for June, 1954, in which the virtues of job organization were extolled. The burden of that message is that you will find it mighty difficult to work from a plain list of all your duties. There are simply too many of them crying for your time. But if you take the same duties and catalog them under a few broad classifications, you find that your work is much more bearable. Organization does the trick.

Dividing your own responsibilities into an orderly pattern is the first order of business. Then you can begin to study in similar manner the total amount of work to be handled by your crew, greatly increasing your skill in making reasonable work assignments.

Division of responsibility is not a one-shot treatment, though. You will be called upon to make almost continuous revisions of your job organization, as required by personnel changes within the crew, absenteeism or lack of proficiency in certain men at certain jobs. You can make these revisions without too much strain if you have a plan for dividing responsibilities and a fair amount of practice in doing so.

The Tremendous Value of So-Called "Scraps of Useless Information"

Sordid, maybe, but nonetheless efficient is the American penchant for measuring value against the yardstick of money. We are prone to measure even abilities, talents and skills primarily in terms of the money that can be made from them. It has become our habit to classify as useful only the knowledge and skills having a ready convertibility into cool cash. The remainder of the stuff in our heads is written off as "scraps of useless information."

But a weekly 30-min TV program, "The $64,000 Question," has struck a mortal blow at this thesis. A few weeks ago a little girl turned her ability to spell outlandish words like antidisestablishmentarianism into $16,000. A Marine captain named McCutcheon racked up $64,000 on a bizarre knowledge of foods and cooking, and now a 71-yr-old grandmother is heading into the big money on—of all things—her knowledge of baseball. Useless information? Heavens, no!

It may even come to pass that the little nut-meats of wisdom in your cranial cache some day will be worth a lot of money. Chances are you won't appear on television, but the big payoff can come in a number of other ways. Here's how a dredging supervisor, working in New York harbor, pulled the trick for his company.

New Jersey Turnpike authorities solicited bids for the construction of a link between the turnpike and the Holland Tunnel. Gahagan Construction Corp., New York, submitted a bid on a subcontract calling for the placement of a certain kind of sand for the 2-mi roadbed. The Gahagan bid of approximately $4 million was about $1 million below the next higher one, causing most people familiar with the business to figure that a disastrous mistake had been made by Gahagan's estimators. This was not the case, however.

You see, everyone else figured on trucking the sand into the construction site. But Vincent Hussin, Gahagan's dredging boss, has a head full of little scraps of knowledge concerning the floor of the harbor. He ran some tests, and found the right sand for the job under the muck in back of Bedloe's Island, the home of the Statue of Liberty. So 3½ million cu yd of sand was sucked out of the deposits and economically pumped 16,000 ft through a floating 27-in pipe line to the roadbed which skirts the water's edge. The bid stands as good as gold, and each employee of the company benefits from Mr. Hussin's mental file.

We suppose the moral is that there is no such thing as useless information. Somewhere, sometime, the most unobtrusive bit of intelligence may blossom into a valuable practical application.

with Gulf Mining Machine Lubricant

Extra steps, extra applications, and extra handling cost money. Progressive mining concerns have found they can eliminate these costly extras with Gulf Mining Machine Lubricant. This cost-saving lubricant can often do the entire lubricating job at the face, thus simplifying lubricant storage and handling. It also lessens the danger of application errors. Avoid the extras—when you can do the job with one grease, why use more?

Gulf Mining Machine Lubricant not only replaces several other lubricants, but does a better job because of its heavy body, excellent adhesiveness, and resistance to the washing action of water. You will find that it provides effective protection for plain and antifriction bearings, crawler mechanisms, and gear boxes.

A Gulf Sales Engineer is as near as your telephone. Consult the telephone directory for the number of your local Gulf office and have him demonstrate the many time-saving, cost-cutting advantages of Gulf Mining Machine Lubricant on your equipment.

GULF OIL CORPORATION • GULF REFINING COMPANY
1822 Gulf Building, Pittsburgh 30, Pa.

GULF

THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS

OPERATING IDEAS

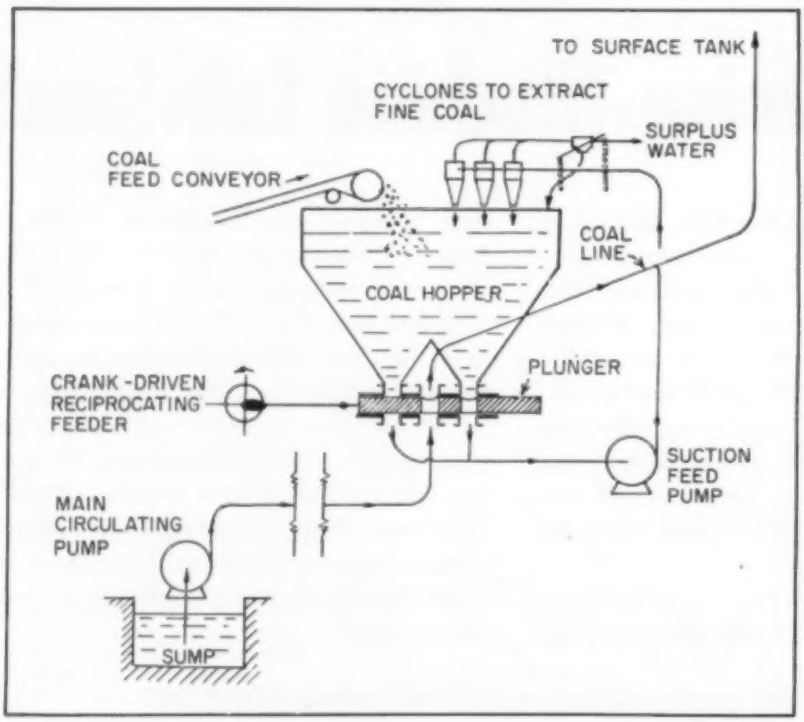
Carbon Dioxide Provides Emergency Power for Air Brakes

EMERGENCY POWER to operate locomotive brakes in event of a failure of the air pressure can be had at a relatively low cost, reports Mr. R. D. Greer, assistant mine superintendent, Inland Steel Co., Wheelwright, Ky. He supplied the accompanying photo to show how a small tank of carbon dioxide was fitted into the cab of one of their 15-ton mainline locomotives to serve as an emergency source of brake power.

The small tank of compressed gas, mounted in the left side of the cab, is permanently connected to the brake line by a high-pressure hose. A release valve, within easy reach of the motorman, can be opened immediately to operate the brakes.

Failure of air pressure on the braking system of a locomotive several years ago caused a bad wreck when the motorman lost control of the trip. This started management on a search for an emergency source of power and resulted in application of carbon dioxide as an emergency power source. Emergency tanks are surplus rupture-disk type and Mr. Greer notes that they are very reliable.

Pumping Widens Hoisting Horizon



CAN COAL BE HOISTED to the surface by pumping rather than by conventional methods? This question has been asked at various times in the past. Now the answer may be in the offing with the full-scale NBC-sponsored installation at the Woodend colliery in Scotland, according to article in the Aug. 4 issue of the *Colliery Guardian*. About 750 gpm of coal and water is said to be pumped 250-ft vertically to a surface plant through 400 ft of 7-in pipe.

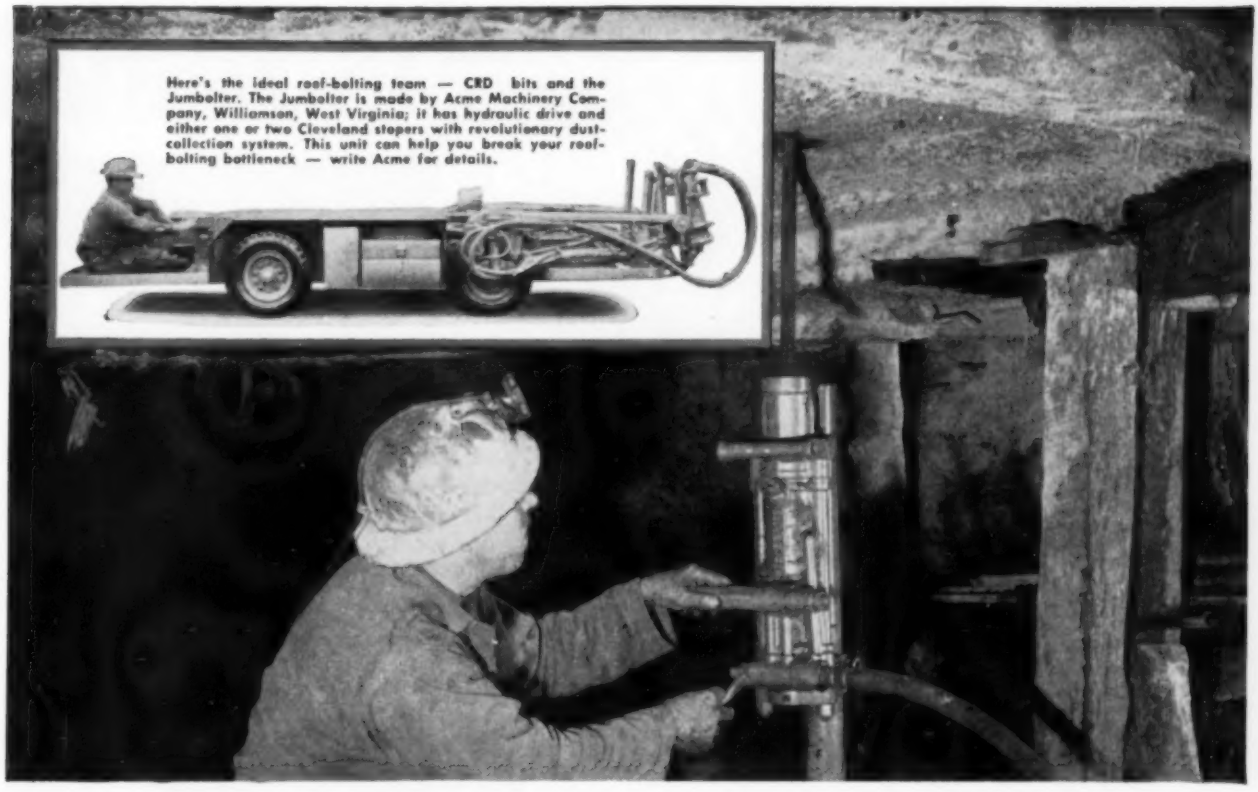
Run-of-mine coal is fed to a shaker screen that removes the 2x0 and deposits it on an elevating belt conveyor for delivery to a hopper. A 9-in-diameter cylindrical plunger-type feeder moves back and forth under two exit valves in the bottom of the hopper and controls the coal flow.

The large piston-type valve pulls coal from the exit valves and moves it into the main pump circuit. The 9-in piston is bored diametrically with two 7-in holes that coincide with the hopper feed valves and the main delivery valve midway between them. When the plunger moves the full distance in one direction, one hole, or "bucket," is under a hopper valve receiving coal while the other is lined up with the main delivery line and being flushed of its load. Feed thus alternates between the two exit valves. The plunger is completely sealed to prevent water leakage from the pumping circuit.

To speed coal fall into the plunger, suction valves are fitted into the bottom of the hopper to draw the water out and the coal in. Thus a full load is assured for each stroke. Suction is provided by a 30-hp low-head 500-gpm pump.

The plunger is operated by a crank driven by a 10-hp motor with a flywheel speed of 90 rpm. Thus an average of 180 "buckets" of coal per min are fed to the main pipe line. If the buckets are filled, up to 60 tph of coal will be raised to the surface.

On the surface, the 7-in pipe line discharges onto a vibrating screen that removes and dewaters the larger sizes and feeds it to a loading conveyor. The fines drop into a receiving tank and are



The Price Alone of CRD one-use bits can lower your drilling costs

. . . and they are made and backed by CLEVELAND Rock Drill

How do Cleveland CRD one-use bits save you money? It's just plain economics. You see, the price of CRD bits on an average, is less than one-half that of a multi-use bit. In fact, the price of a CRD bit comes close to matching the cost of reconditioning a multi-use bit.

So the price alone of CRD one-use bits can help you cut your drilling costs. But there are other reasons to use CRD bits, too.

Faster Drilling Speed — Special offset gauge feature, which permits the use of thinner wings and a steeper reaming angle, greatly reduces binding and provides ample clearance for cuttings. Result is a free, fast-cutting, chiseling action that gives you greater drilling speed.

Less Drill-Steel Breakage — The method of attachment used with the CRD bit eliminates threads on the drill rod. Since a drill rod is only as strong as the root diameters of its threads, the tapered threadless CRD design provides longer drill-steel life — reduces drill-steel handling and reconditioning costs.

Lower Rock Drill Repair Costs — Because the CRD bit design reduces binding in the hole, there is less strain on the rotation parts of your rock drills. Rifle bars, rifle nuts, and chucks last longer. You get more drilling done at lower cost.

Since no special equipment is needed for reconditioning bits or threading rods, you owe it to yourself to try a can of CRD bits. They're ideal for roof-bolting. A short trial will give you first-hand information on the ability of these bits to cut drilling costs in your property, as they have in so many others.

Bulletin RD-29 gives detailed information. A copy is yours for the asking — just write for it.

SPECIFICATIONS

Mines everywhere cut drilling costs with CRD DETACHABLE DRILL BITS
4-Wing Type — Center Hole — Side Hole

Series "A" Bits For series "A" drill steel connection on any steel. Best suited to ⅞" steel.	1¼	Aluminum	Series "B" Bits For series "B" drill steel connection on any steel. Best suited to 1", 1⅛", and 1¼" steel.	1⁷⁄₁₆	Orange
	1⁵⁄₁₆	Pink		1½	Green
	1⅜	Deep Green		1⁹⁄₁₆	Yellow
	1⁷⁄₁₆	Brown		1⅝	White
	1½	Grey		1¹¹⁄₁₆	Black
	1⁹⁄₁₆	Maroon		1¾	Red
	1⅝	Deep Blue		1¹³⁄₁₆	Blue
				1⅞	Tan
				1¹⁵⁄₁₆	Plain
				2	Pink
				2⅛	Maroon
				2¼	Aluminum

Cans are labeled showing size of steel socket, gauge of bit, and color.

CLEVELAND ROCK DRILL DIVISION
Westinghouse Air Brake Co.

12500 BEREA ROAD
CLEVELAND 11, OHIO

RD-61

dredged out by perforated buckets and elevated to a hopper for loading into railroad cars.

At this stage of the experiment, the full benefits of the system are reported to be hard to evaluate but are believed to include less fire and dust hazard, flexibility of design and simplicity of equipment. Some of the unknowns to be explored in the next several years include: size of coal that can be handled; best coal to water ratio; automatic control; flow characteristics of solids in pipes; and general improvement in the design and layout.

Cold-Weather Care Prevents Tractor Headaches

WINTER is right around the corner. Bulldozers and tractors soon will be operating under tough conditions in mud, snow, water and freezing weather. With a little forethought and planning you can keep your machines in top-operating condition regardless of the severity of the weather. Here are some suggestions offered by the Caterpiller Tractor Co., Peoria, Ill.

Leaking radiators, hose, water pumps or gaskets usually are only a nuisance in summer. But when the temperature drops, they are an invitation to trouble. A stretched or frayed fan belt should be replaced, especially if it drives a water pump.

If you have a machine that will not be used this winter, keep the engine rust free by pouring a cup of crankcase oil into each cylinder once a month. Crank the engine a few turns with the compression off at least once a week to keep the cylinder walls coated with oil. Several tablespoonfuls of oil also should be put in the starting engine at the same time.

Water in diesel fuel always is a headache and in freezing weather fouls up fuel lines and filters. Properly stored fuel contains practically no water but when machines are refueled in snow or rain, some water can get in the fuel tank. To prevent moisture condensation in the tank, fuel tanks should be filled at the end of each day's operation. Drain off about a quart before starting the next morning—any water will be removed before it gets in the fuel system.

Check over the valves and cylinders of the starting engine. They must be in good condition, otherwise starting will be difficult. Avoid overchoking and fast idling speeds during low-temperature operation.

Drain plugs and gaskets in steering-clutch enclosures and dry flywheel clutch compartments should be securely in place to prevent accumulation of debris and mud which may freeze and cause serious damage to the working parts.

Tracks, track rollers and carrier rollers require more attention in cold weather. Snow often packs between the track rails, causing excessively tight tracks. Special snow track grousers with holes in their centers eliminate packing and should be used to prevent tight tracks.

Never park a machine where there is danger of freezing the tracks to the ground. A simple log berth will prevent freezing and will relieve the operator of a lot of work when the unit is to be moved.

Frozen mud can lock rollers and carrier rollers tight and if a machine is run any distance with frozen rollers, the track rails will wear flat spots on them. Track assemblies should be cleaned as soon as the machine is parked to prevent this and to keep maintenance costs to a minimum.

Sodium Lighting Eases Slate-Picking Job

EASIER SLATE PICKING at the Lady Victoria Colliery in the Lothian area of the Scottish Div. of the National Coal Board has been achieved by installing sodium lighting over a picking belt. The new lighting makes the coal surface glisten while the refuse appears dull. As a result of this great contrast between the appearance of coal and refuse, inexperienced workers can be employed on the belt. Another advantage is that little refuse is left in the coal since it is almost impossible for dirt to go undetected under the lighting.

As a result of the outstanding success of the first installation, more sodium lights were placed over six other belts at other collieries. Equipment for the lighting was provided by the General Electric Co., Ltd. and included 80-w Osram sodium lamps housed in 12 dispersive reflectors over the center of the belt. Reflectors are vitreous enameled grey outside and white inside. A sorbo-rubber gasket provides a dust-tight seal between the reflector and the glass cover. To speed lamp changing, the metal frame supporting the cover is secured by two thumbscrews and hinged.

FAIRMONT PREPARATION PLANTS

. . . with Planned thinking and production

For over 58 years, Fairmont has met coal preparation requirements with *planned* thinking and coordinated production. This planning, from the very beginning, has made Fairmont-built plants pace-setters for separating efficiency and product up-grading. You see, when you operate a Fairmont built plant, you have separating facilities custom-designed to meet your specific requirements—an economical, independent selection of equipment to do the job makes this possible. In addition, your plant is prepared to cope with future production, as well as present, with little additional cost.

Take advantage of experience . . . call a Fairmont Engineer . . . plan today for increased separating efficiency with a Fairmont-built preparation plant that will guarantee product uniformity and quality at low operating cost.

FAIRMONT

MACHINERY COMPANY

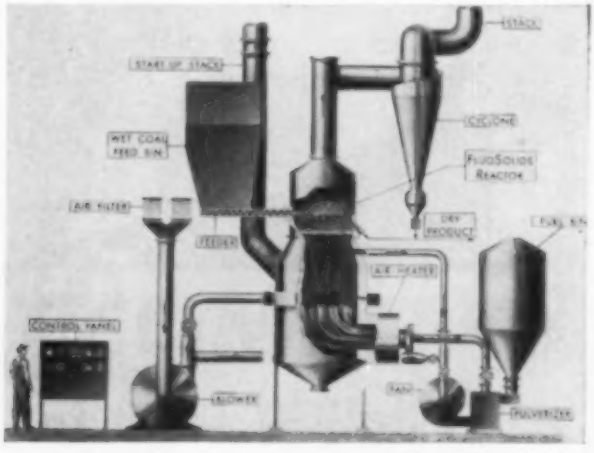
FAIRMONT, WEST VIRGINIA

DESIGNERS AND CONSTRUCTORS OF COMPLETE COAL PREPARATION PLANTS USING BOTH WET AND DRY CLEANING, CENTRIFUGAL AND THERMAL DRYING.

EQUIPMENT NEWS

Suspension Design Replaces Rigid Belt Frame

A radical departure from the conventional-style rigid-structural-frame belt conveyor for mine use is offered in a new rope belt conveyor introduced by Goodman Mfg. Co. With this unit the conveyor belt is carried on chain-linked idler rolls suspended between taut parallel wire ropes. The flexibility of the linked idlers and of the ropes insures shock-free belt travel from start to finish since the idlers and ropes conform to the load rather than forcing the load to conform to a definite contour or position. The elimination of shock from idlers, and of idler impact from belt, should lengthen the life of the belt as well as all conveyor units, says Goodman. The parallel ropes insure true alignment between anchor points and the self-aligning idler rolls maintain belt alignment. Installation is simple, says Goodman, and extensions can be made between shifts, saving production time. The rope-belt conveyor conforms to uneven mine bottom and can be suspended over surface gullies and roads. Details from Goodman, Halsted St. & 48th Pl., Chicago 9, Ill.



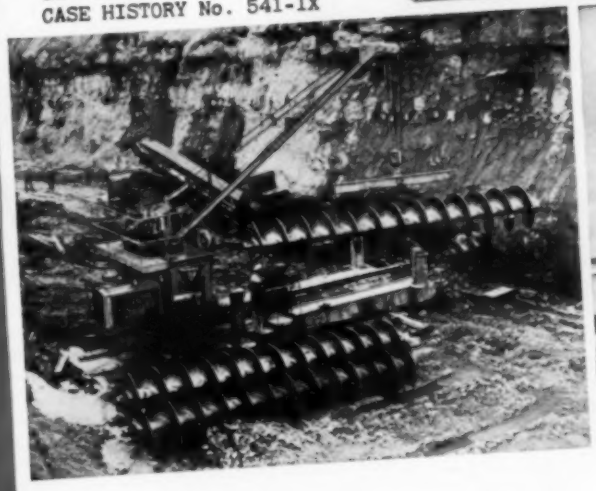
Drier Uses Fluidization Principle

A modified and redesigned system for heat drying fine coal without measurable oxidation has been produced by Dorr-Oliver, Inc. Named the Dorrco FluSolids System, the unit employs what the company terms the principles of fluidization. Quick, efficient drying, it reports, results from rapid heat transfer and almost instantaneous vaporization of free moisture.

The primary component of the system is a two-compartment reactor. In the lower nonfluidized combustion chamber pulverized coal is burned to produce the necessary heat for drying. Directly above is a fluidized drying compartment, separated from the combustion chamber by a specially designed constriction plate. Wet coal is introduced into the fluid bed by a screw conveyor. The coarse dried product is discharged just below fluid-bed level, and fine dried material entrained in the exit gases is collected in a cyclone. In operation, coal to be used as fuel is ground in a pulverizer and blown by a mixture of fresh air and recycled hot gases into the air heater, where it is ignited. After combustion in the lower section of the bottom compartment, tempering air is introduced through a bustle pipe around the chamber. The resulting mixture of hot gases rise into the drying compartment, fluidizing the bed of coal and holding the particles in suspension. Incoming feed is brought up to temperature immediately and the moisture evaporated. Dried products may be either segregated or recombined.

The recommended operating temperature is 150 to 160 F. But, temperature may be varied for the requirement of a specific application. Varying either the wet-coal feed rate or fuel consumption controls temperature. Product moisture content may be controlled at any desired level; usually 2 to 3% is normal. The system may be modified for other fuels and is adaptable to normal preparation plant start-up and shut-down requirements. The major advantage of the system, says Dorr-Oliver, is an unusualy high drying capacity. A single unit can handle as much as 200 tons of coal per hour. Developed to dry ¼x0 coal, the system has dried material as coarse as 1½x0. More information from Dorr-Oliver, Incorporated, Barry Pl., Stamford, Conn.

GM DIESEL
CASE HISTORY No. 541-1X



OWNER: Peel Tree Mine, Clarksburg, W. Va.

INSTALLATION: GM "4-71" Diesel powers 42" McCarthy Coal Recovery Drill built by Salem Tool Company, Salem, Ohio.

PERFORMANCE: Mines up to 500 tons coal per day with 3-man crew. Works 9 to 11 hours per day drilling 170-foot holes 42" in diameter.

It Pays to STANDARDIZE on

... available in more than 750 models of equipment built by over 150 manufacturers

GM
GENERAL MOTORS
DIESEL POWER

MINES 500 TONS PER DAY *with GM Diesel Power*

Quick-acting General Motors 2-cycle Diesel power speeds production and cuts costs in every kind of mining operation.

With power at every piston downstroke from 2-cycle operation, a GM Diesel accelerates faster, responds to controls quicker. It fits where other Diesels won't in many kinds of mining equipment because it packs more power into a smaller, lighter engine. Clean simple design makes maintenance easy, speeds servicing. And when parts are needed, GM Diesel distributors give quick delivery at low cost.

Call in your GM Diesel distributor for full details on GM Diesel power for your mine. And before you buy a Diesel, check parts costs, too. For example, GM Diesel cylinder liners cost up to 40% *less* than liners for other Diesels of comparable power. That's one reason why GM Diesels cost less to buy and less to maintain than other Diesel engines.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines... 30 to 300 H.P. Multiple Units... Up to 893 H.P.

Dump Trucks Carry 8 Yds

For heavy dumper work up to 8-yd capacity, Mack has introduced two trucks, the gasoline-powered B-60X and the diesel-powered B-61X. Rated at 46,000 lb gross vehicle weight, they are offered with a 158½-in wheelbase adapted to 10- or 11-ft dump bodies. Standard tires are 11.00-24, 14-ply, single front and dual rear, on 8.5 rims mounted on steel-spoked wheels.

For the gasoline-powered model, the Thermodyne EN-464A engine of 185 hp is supplied with a choice of the standard five-speed direct-in-fifth transmission, or a nine-speed overgeared wide-range type. The diesel-powered model uses the Mack Thermodyne diesel, END-673, 170 hp, with a choice of a five-speed direct-in-fifth as standard, and an option of a nine-speed overgeared transmission.

Rear axles in both models are massive dual-reduction units equipped with radius rods and torque arms. Service brakes are air-actuated with a total area of 710 sq in. The rear drums are 17¼ x 6 in. The hand brake is of the internal-expanding type, located on the transmission tailshaft, with 139 sq in of area.

Frames are of pressed chrome-manganese steel, heat-treated, in double channel form, 10½ in deep, with 3¼-in flange, both inside and outside rails ¼-in thick, giving a section modulus of 21.9. They are braced with channel cross-members with wrap-around broadly-spread gussets.

The cab and entire front-end sheet metal assembly is a single independent structure supported in rubber from the frame. The driver's seat is adjustable in all directions. Instruments are grouped on a pull-out panel and all fuses are exposed when the glove-compartment door is opened. Mack Truck Corp., 350 5th Ave., New York 1, N. Y.

40-Ton Dump for Big Loads

A 40-ton spring-mounted dump truck, numbered the 803 and believed to be the largest two-axle dump truck being built today, is being produced by Kenworth Motor Truck Corp., 8801 East Marginal Way, Seattle, Wash. Three have been constructed and are being used to haul iron ore in southern California. Engineered for big off-highway hauling jobs in open-pit mining and earth or rock moving, the model dwarfs previous Kenworth trucks. Body capacity is 24 cu yd, heaped load (2 to 1), 28 cu yd. With a gross vehicle weight rating of 150,000 lb, the chassis weight with body is 68,000 lb. The truck measures 12 ft across the front hubs and is 14 ft off the ground over the one-man cab shield.

It is powered by a diesel engine that varies between 300 and 500 hp depending on the grades of the loaded haul. Turning radius is 36½ ft with a turning angle of 30 deg. The front-axle capacity is 50,000 lb, with an 8-in I-beam center section. A 100,000-lb-capacity rear axle is designed for wheel bearings with an 8-in bore. Control of the big dump truck has been given special attention by Kenworth engineers. A' power-steering system features a full circle steering arm and has two hydraulic cylinders, the main cylinder exerting a force of 15,000 lb. The 803 carries 70 gal of hydraulic oil to operate its steering gear, pumps, hoists and other hydraulic apparatus. The rear brakes feature dual sets of shoes in each drum, operated by four separate air chambers, allowing greater brake pressure to be applied. The front and rear brake shoes are interchangeable.

PORTABLE LAMP DESIGNED FOR TEMPORARY LIGHT

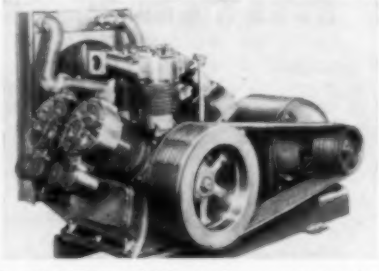
Designed to give temporary illumination in hard to reach areas and dark spots, a vaportight portable fluorescent lamp has been added to the line of Day-Ray Products, Inc., Pasadena, Calif. Features of the lamp, says the manufacturer, are: no glare, coolness, easy handling and easy hook-up. It is manufactured in 15- and 30-w sizes.

TAPERED RIGID FRAME USED IN STEEL BUILDINGS

The basic feature of an additional building line offered by Steelcraft Mfg. Co. is a new structural-steel system, the tapered rigid frame. The new buildings, says the company, have been added to supplement truss type and rigid frame steel buildings. Another feature of the building is a superimposed fastening system which speeds up covering the framework. Extruded holes in the purlins and girts provide a locating point for connecting roof and wall sheets. The method was introduced by the company to eliminate inside labor and scaffolding, since one man can attach the sheets from the sides or roof of a building. Catalog available from Steelcraft Mfg. Co., 9017 Blue Ash Rd., Rossmoyne, Ohio.

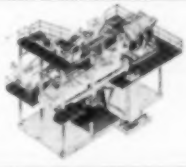
COMPRESSOR'S DESIGN CUTS NOISE AND VIBRATION

An additional line of stationary two-stage air-cooled electric-motor-driven compressors has been introduced by the



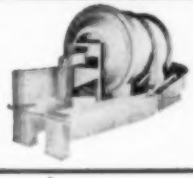
Le Roi Div. of Westinghouse Air Brake Co. The compressors, 50-, 75- and 100-hp, have displacements of 260, 415 and 550 cfm at 125-psi operating pressure. The company says they are "ideal for applications where compactness, light weight and a minimum of operator attention are required. The 3-cylinder 50S2 and 6-cylinder 75S2 and 100S2 compressors have a balanced design intended to reduce vibration and noise." Cylinders are made of alloy iron and are cooled by a high-speed belt-driven fan which draws air through a sectional-core intercooler and directs air over the cylinders and

Wemco answers your coal cleaning problems



WEMCO HMS MOBIL-MILLS

World's most widely used heavy media separation plants; available with a choice of separatory vessels; capacities 25 to 500 TPH; will handle feed range from 8" to 3/32".



TWO-COMPARTMENT DRUM SEPARATORS

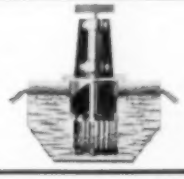
Two-gravity, three-product heavy media separation in one vessel. Less than 1% misplaced material on a feed of 114 TPH of 2½" x ¼" coal indicated in typical operating report.

WEMCO HMS EQUIPMENT FOR CUSTOM PLANTS

Separatory drums and cones, densifiers, medium pumps and media reclamation circuits of the superior designs so thoroughly proven in the Wemco Mobil-Mills.

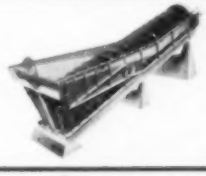
WEMCO TORQUE-FLOW SOLIDS PUMP

A remarkable new pump that can handle chunks up to several inches in diameter; available in capacities 100 to 3,000 GPM; handles heads up to 120 feet.



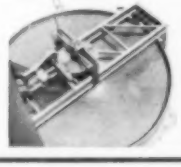
FAGERGREN FLOTATION MACHINES

Most efficient per cubic foot of all modern flotation machines. Extract saleable coal in the range from 14 to 325 mesh plus solving disposal problem.



WEMCO COAL SPIRALS

Efficient, low cost dewatering and/or sizing device that achieves more complete moisture removal than the drag tank; also fewer working parts and no stalling problems.



WEMCO HYDROSEPARATORS

High capacity means for making an efficient separation in the 200 mesh range; used to deslime coal ahead of tabling or flotation; diameters to 150 feet.

WEMCO LABORATORY SERVICES

All necessary tests are available to determine practicability of various coal cleaning methods for treating your run-of-mine coal.

WEMCO THICKENERS

The perfect compromise between acreage and horsepower in clarifying water for closed circuits, or for pollution-free stream disposal; diameters to 400 feet.

The full available information on any of the above equipment items will gladly be mailed in answer to your inquiry. More detailed recommendations for your specific coal cleaning problem will also be furnished, if desired. Write Dept. G-2212.

WEMCO
WESTERN MACHINERY COMPANY
760-766 FOLSOM STREET · SAN FRANCISCO 7, CALIFORNIA

Representatives in principal cities of the United States and Canada and in major countries throughout the world.

heads. Each bank of cylinders has individual intake filters. A plunger-type pump force-feeds lubricating oils. Information from Sales Promotion Dept., Le Roi Div., Westinghouse Air Brake Co., 1706 S. 68 St., Milwaukee, Wis.

VERTICAL DRILL DESIGNED FOR 24-IN AUGERS

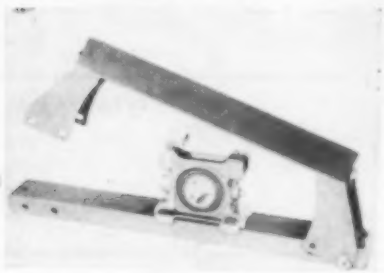
A McCarthy vertical drill, Model 106-24, designed for strip-mine operation, blast-hole drilling and dewatering operations, is described in the 4-p Bulletin M-100, published by the Salem Tool Co., S. Ellsworth Ave., Salem, Ohio. The drill handles augers 6 ft long up to 24 in in diameter.

An auxiliary speed reducing unit built integrally with the drill's traveling carriage reduces rotary speed and increases torque for large-diameter augers. Two output shafts turn at separate speeds, normal speed for augers up to 8 in and slow speed for augers 12 in in diameter.

Basically the new model is the same as another McCarthy drill, the 106-6-8. Both are equipped with the same engine base and mast. Enclosed 60-hp water-cooled gasoline engines furnish power in both models. Diesel or electric can be substituted at extra cost.

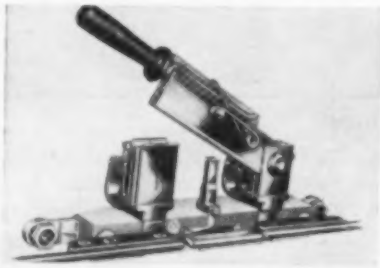
DIESEL-ELECTRIC SYSTEM REPLACED BY HYDRAULICS

A new hydraulic starting system for diesel engines, designed to eliminate heavy-duty electrical systems, was introduced in August by Aeroproducts Operations for the Allison Div. of General Motors, Indianapolis 6, Ind. Named the "Hydrostarter," the equipment consists of a hydraulic motor, a piston-type accumulator, an engine-driven pump, a reservoir and a manual pump. No outside source of energy is needed. After the accumulator has been loaded and sealed with an inert gas, an engine-driven pump maintains pressure and the manual pump permits emergency recharging. The "Hydrostarter" was specially engineered, the company says, to operate in remote installations where there is cold weather and frequent equipment inactivity. During tests at sub-freezing temperatures, the starter provided engine speed beyond present normal starting speeds in less than ½ sec, the company says. It can be coupled to nearly all diesel engines up to 300 hp in the same way as a conventional electric starter.



REDESIGN BEARING BLOCKS BELT TAKEUP BRACKETS

New designs have been added to the Link-Belt DS takeup, a company spokesman disclosed last month. In one design a one-piece hinged top frame permits easy access to the bearing block and adjusting screw. The top swings upward after three bolts are removed from the base. In another design an arch-frame has been used to add strength to end brackets. Welded to the top cover angle, the brackets form a rigid frame designed to withstand loads without twisting or altering bearing alignment. The takeup is interchangeable with previous designs for use on a variety of materials-handling equipment: e.g., apron, belt, chain, drag, flight and slat conveyors. It is available with babbitted, ball or roller bearings. Information, including dimension charts, is available in Folder 2539, Link-Belt Co., Dept. PR, 307 N. Michigan Ave., Chicago 1, Ill.

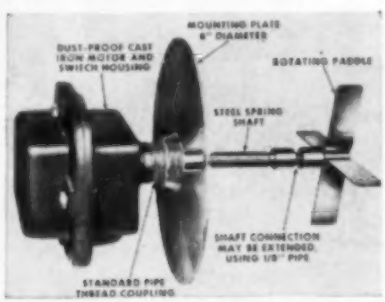


SECTION INSULATOR SWITCH PERMITS SAFETY BLOCKS

A section insulator switch allowing mine operators to maintain adequate safety blocks in feeder-trolley circuits without lowering current-carrying capacity of the circuit has been developed by the Ohio Brass Co., Mansfield, Ohio. Carrying 1,500 amp, the switch maintains a continuous smooth collector underrun. Twin switch blades and contact jaws are made of heavy-section hard-drawn copper. A bronze torsion spring provides quick-breaking action and a rubber handle protects the operator. Feeder cable is held in clamp-type terminals, trolley wire in hollow-screw clamping pieces. An adjustable center runner permits smooth underrun even when trolley clamps hold different size trolley wires. When connected to a 1,000,000-CM feeder and 350,000-CM trolley, the switch is rated at 1,500 amp. When connected to 350,000 trolley only, it is rated at 1,000 amp. The switch accommodates 750,000- to 1,600,000-CM feeder and all sizes of Fig. 8, grooved, and No. 9 section trolley. The distance between mounting centers is 22⅛ in.

"SWIRLING" AIR COMBUSTION DESIGN FOR DIESEL ENGINE

A design in moderate speed 4-cycle heavy-duty diesel, dual fuel and gas engines with ratings up to 1,400 hp has been developed by Worthington Corp., Harrison, N. J. The engine, W 9, has a 9-in bore, 11-in stroke and is a 4-cycle 400-1400 hp model aimed for speeds up to 1,000 rpm. It is equipped with "Jet-Swirl" turbocharged power—an air-inlet design that brings air in parallel to the inlet valve stem, swirling it as it enters a cylinder. This, says the company allows ramming larger and more turbulent air charges. Another feature is the use of lowest cost fuels: residual, crude and distillate oils, natural, sewage, propane or manufactured gas.



LEVEL INDICATOR MADE FOR PROBLEM BINS

A paddle-type bin-level indicator for special installations has been introduced by The Bin-Dicator Co., 13946-62 Kercheval Ave., Detroit 1, Mich. The unit, says the company, is adaptable to installations in bins under pressure or vacuum; bins, chutes or conveyors handling materials containing large lumps which tend to "bridge" over a diaphragm; and bins handling materials which tend to "rat-hole" and prevent operation of a diaphragm. The "Roto-Bin-Dicator" has a slowly rotating paddle, mounted on a flexible shaft. The paddle projects into the bin and is driven by a small motor mounted in a housing outside the bin. When material in the bin partially or entirely covers the paddle, the rotation is

BIG payload capacity

(obtained with USS COR-TEN steel construction)

pays off on 54-mile delivery haul

Motor Freight, Inc., of New Philadelphia, Ohio, hauls coal under contract from mine to chemical plant 54 miles away. In such an operation, the bigger the payload the bigger the payoff because it means more coal hauled in fewer trips.

That's why they bought this two-trailer hopper train with USS COR-TEN Steel used in thinner sections to cut down dead weight. This equipment weighs only 29,500 pounds empty, yet can carry 48,500 pounds of payload and still meet the Ohio legal gross weight limit of 78,000 pounds. The result, lower costs per haul, more profit for the hauler.

Says Robert Ress of Motor Freight, Inc., "This unit has been in operation only since February but has already hauled almost 8,000 tons at an average of 23.4 tons per load. We expect at least 8 to 10 years of service from it. Our future trucks will be of the same COR-TEN Steel construction."

USS High Strength Steels—USS COR-TEN, USS MAN-TEN and USS TRI-TEN—can be used singly or in combination to replace carbon steel in the vital parts of your equipment to (1) increase the service life without increasing dead weight, or (2) reduce equipment weight without reducing its strength, or (3) increase the size and capacity of equipment without increasing the total weight or the power needed to move it.

Call or write for more information

62% of the gross weight is payload. This equipment, loaded with fine coal, is ready for a 54-mile run from a coal mine owned by the Columbia-Southern Chemical Corporation, a subsidiary of Pittsburgh Plate Glass Company, to the company's plant in Barberton, Ohio. The Marion Metal Products Co., builders of this new hauler, reduced dead weight by using USS COR-TEN Steel in thinner sections, and provided lasting strength and long life because COR-TEN Steel has 4 to 6 times the resistance to atmospheric corrosion of structural carbon steel.

NOW AVAILABLE—Our new "Design Manual for High Strength Steels" is ready for distribution. This excellent book contains comprehensive and practical information that you will find extremely useful in designing your product for greater economy and efficiency by the sound use of high strength steels.

For your free copy, write on your company letterhead giving your title or department to United States Steel Corporation, Room 4895, 525 William Penn Place, Pittsburgh 30, Pa.

See "THE UNITED STATES STEEL HOUR"—Televised alternate weeks—Consult your newspaper for time and station.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS HIGH STRENGTH STEELS

USS

UNITED STATES STEEL

stopped and the torque exerted by the motor flips a microswitch in the motor housing. When material drops below the paddle, rotation is resumed and the microswitch returns to normal position. The shaft is engineered to flex under impact or thrust of material and prevent permanent distortion. Being flexible, it sheds top loads and retains its freedom to move as required. Installation requires a hole in the bin wall to admit the paddle, attachment of a steel plate with six screws and connection to a power source. Bulletin available from Bin-Dicator.

ELECTRONICS HELPS DETECT MOTOR, MACHINERY BREAKS

A portable electronic instrument designed to detect motor and machinery faults, bearing failures, pipe-line leaks and surface flaws in a number of materials has been introduced by John Ould (U.S.A.), Ltd., 519 So. Fifth Ave., Mt. Vernon, N. Y. The instrument "Auditec," says its maker, will locate mechanical troubles early enough to prevent costly breakdowns and production loss. Its design depends on an idea that impending breakdown is accompanied by an inaudible warning. With "Auditec," an operator can hear these sounds, then trace the source without teaning down the unit. The detector weighs 2½ lb and consists of a sensitive contact-microphone encased in a probe handle, a three-stage amplifier and plug-in headphones. Visual measurement can be obtained by adding an output meter. Standard batteries power the unit. "Auditec" locates a trouble spot when the probe is touched to a suspected area. Since the probe picks up sound only by actual contact it is not affected by airborne noises.

NYLON REPLACES COTTON, JUTE TUBING

A different construction of du Pont's "Ventube" rubberized ventilation tubing fabric has been developed from heavyweight nylon fabric coated on both sides with neoprene synthetic rubber. Previously, mine, tunnel and subway auxiliary ventilation fabrics had been made of coated jute and cotton which, although treated with anti-fungus compounds, possessed a life expectancy far below that of mildew-resistant nylon. The new tubing combines mildew resist-

Here the Model D shapes a new haul road. With sure-footed tandem drive, this machine has traction and stability to handle jobs never before even considered for a grader this size.

Graded Haul Roads Increase Your Earnings

HAUL roads shaped and maintained with your own motor grader help step up output and cut costs on logging operations. Here's why:

1 Grader-maintained roads are smoother, better contoured—permit hauling units to make more trips per day.

2 Frequent grading eliminates ruts and potholes, cuts costly wear and strains on trucks.

3 Operations can proceed on schedule *in any weather* —graded roads drain fast, dry quickly.

And you get all these advantages . . . at the lowest possible cost with the Allis-Chalmers Model D.

First, it is built for the job, with all the features of a big grader — tandem drive, power hydraulic controls, fully visible blade, high-arch front axle, optional leaning front wheels, and power circle turn — yet costs only ⅓ as much as the large machines. It has the power, traction and balance to keep roads in really serviceable condition at far less cost than bigger, more expensive equipment.

The Model D is economical to own and operate — runs all day on a tank of gas. Even an inexperienced person can learn to run this machine in a surprisingly short time.

The Model D is available with a choice of gasoline or diesel engines. A full range of accessories include rear-end loader, scarifier, windrow eliminator, all-view cab, heavy-duty front tires, blade and V-type snowplows.

Write now for free catalog or see your Allis-Chalmers dealer for a demonstration.

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

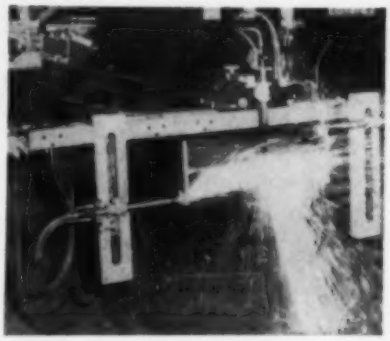
WEIGHT: 8,800 lb.
BRAKE HP: 50

SPEEDS: Four forward to 25.6 mph
Reverse to 3.3 mph

Here the Model D loads gravel from a hillside bed . . .

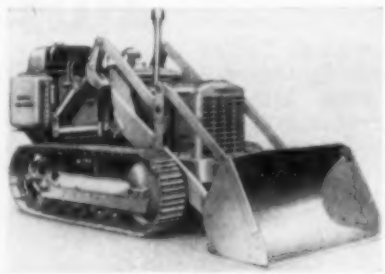
and carries it out to a soft spot in the haul road. This rear-mounted hydraulic shovel with ½-yd bucket loads dirt, stockpiles bulk material, etc.

ance with high strength. It is less than one-half the weight of present fabrics, employing 5.5 oz-per-sq yd nylon fabric. Porosity resistance of the fabric, numbered 5740, is 2½ times the operating pressure normally used. Further information from E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.



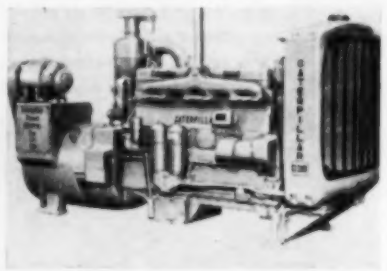
TORCH SAW TO COMPETE AGAINST MECHANICAL UNIT

"Flame Saw," designed to cut heavy steel structurals, is being sold by The K-G Equipment Co., Inc., Allentown, Pa. The unit, according to the manufacturer, priced at $1,500, competes with mechanical sawing units several times that price. Hand-portable it will cut structurals at any angle. A 110-v power supply, oxygen and fuel gas are required. An extra length of track and a radius rod make the saw adaptable for straight-line or circle cutting. A roller-bearing wheeled table-height tubular-steel carriage provides portability and versatility. The manufacturer lists these features: structurals 3 to 36 in any-angle miter cut, and positive finger-tip control of machine speed and torch position.



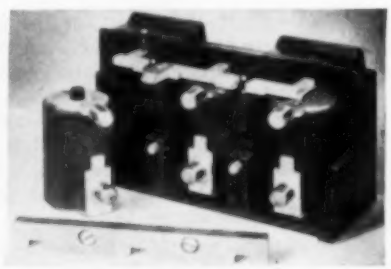
STOCKPILE TIME CUT SEEN WITH NEW TRAXCAVATORS

The second and third Traxcavators to be developed in Caterpillar Tractor Co.'s expanding line of tractor shovels have been announced by the company. One, the 955, is equipped with a 1½-cu yd bucket that can be tilted as much as 40 deg at the ground line. This means, says the company, less time in stockpile loading because the bucket can be driven into a pile, tilted back and a full load picked up in one pass. The other Traxcavator, the 933, is a smaller machine and carries a 1-cu yd bucket. But, the company says, all the design advantages in the larger 955 have been worked into the 933, including 40-deg bucket tilt. Both models are sold with a choice of either a gasoline starting system, equipped with 6-v electric starting, or a 24-v dc starting system. Information from Caterpillar Tractor Co., Peoria 8, Ill.



SELF-REGULATED GENERATOR HAS CLOSE VOLT CONTROL

The first of new self-regulated-generator diesel-electric sets has been announced by Caterpillar Tractor Co., Peoria 8, Ill. The unit features close voltage regulation and provides steady voltage from no load to full load. During initial installation "terminal" voltage and voltage "droop" can be adjusted to meet special conditions of a particular application. After that, adjustments are locked and no further ones are necessary. No switchgear or external voltage regulators are needed during installation and the set can be paralleled with most generators of any make. Leads can be taken from the side, back or top without affecting the machine width. A reduction in frame size, disc-type coupling and top-mounted exciter results in a shorter over-all power package. Heavy-duty, single-bearing and close-coupled construction are intended to make the new generator easy to maintain. A single bearing is lubricated from a grease reservoir that requires filling once a year. A static regulator that contains no moving parts is used with the set.



CIRCUIT BREAKER GUARDS AGAINST SHORTED CURRENT

A low-voltage circuit breaker designed to provide protection against short-circuit current up to 100,000 rms amp has been developed by I-T-E Circuit Breaker Co. The Cordon circuit breaker unites a current-limiting device with a standard molded-case circuit breaker in a common molded housing the same width and depth but a few inches longer than the standard comparable-size breaker. The standard circuit breaker section contains a conventional thermal trip (for minor overloads) and instantaneous magnetic trip (for all faults below extreme short-circuit currents). Fuses are designed to assume the fault-clearing duty from the

Lowest cost per ton

Self-propelled from hole to hole

Heavy-Rugged-Powerful

● Delivering 250 to 300 tons of coal per day using 36-inch diameter, 6-foot-long augers, the Model 6 McCarthy Coal Recovery Drill lowers your costs per ton and total operating costs. Shorter in length—only 18′ by 6′ wide—the Model 6 operates easily in narrow strip pits or where operators are "facing-off" hillsides for auger boring. The self-propelled drill moves quickly from hole to hole, carrying the same rugged power as the Model 12 and 14 McCarthy Drills.

HYDRAULICALLY OPERATED

LEVELING JACKS **AUGER LIFT** **MOVING JACKS**

AUGER GUIDE **AUGER FEED**

Let us check your property to recommend the right McCarthy Coal Recovery Drill for maximum tonnage at lowest cost. Send for Bul. M-101. The Salem Tool Company, Salem, Ohio.

THE SALEM TOOL COMPANY · SALEM · SALEM, OHIO, U. S. A.

MODEL 6-30-36 x 6 McCARTHY COAL RECOVERY DRILL with G.M.C. 4-cylinder diesel engine, FAU Cotta transmission, 14" Rockford Clutch, speed reducer and box-type main frame and engine base. Sizes available for using 20, 24, 30, 36 and 42" diameter augers.

THE SALEM TOOL COMPANY

SOUTH ELLSWORTH AVE. · SALEM, OHIO, U. S. A.

"EUCS" are PACE-SETTERS for PROFITS

For coal stripping operations Euclid Rear-Dumps and Bottom-Dumps rate high in keeping overburden and coal hauling costs low. Their ability to stay on the job month after month, with less down time for servicing and repairs, has made "Eucs" the first choice of leading mine operators. Have your nearby Euclid dealer make a production and cost estimate for your operation . . . there's no cost or obligation, and there's a good chance that he can show you how to cut your hauling costs.

• Rear-Dump Euclids, of 10, 15, 22, 34 and 50 ton capacities, are powered by diesel engines of 125 to 600 h. p. With standard 5 or 10 speed transmission, or with Torqmatic Drive, they have a range of travel speeds up to 36 m. p. h. with full payload. These "Eucs" are unequalled for performance and low operating cost on the toughest jobs. No matter what your off-the-highway hauling requirements may be, there's a Euclid model that can haul more loads per hour at lower cost per ton or yard moved.

• Bottom-Dump Euclid Coal Haulers are designed and built as complete units . . . they have good power-to-weight ratio and proper weight distribution for traction and ease of handling. Short wheel base of tractor and universal hitch design permit short turns and make these big "Eucs" easy to handle. Large single or dual tires on tractor drive and trailer wheels provide good traction and flotation. Powered by 190 to 300 h. p. engines, with 5 or 10 speed standard transmission or with Torqmatic Drive, these Coal Haulers have capacities of 25, 32 and 40 tons.

EUCLID DIVISION GENERAL MOTORS CORPORATION,
Cleveland 17, Ohio

Euclid Equipment

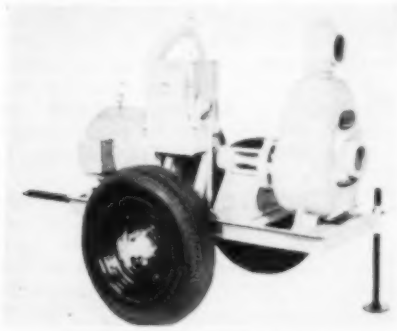
FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

thermal and magnetic trips at 80% of the interrupting rating of the breaker section —at 20,000 amp in the case of a 25,000-amp rated circuit breaker. The fuse element is a specially designed current-limiting device, called "Amp-trap," manufactured by Chase-Shawmut Co., Newburyport, Mass., an I-T-E subsidiary. The breaker—for voltages up to 480 v ac, 3-phase, or 250 v dc—will be available in four frame sizes with continuous current ratings of 100, 225, 400 and 600 amp. Additional information from I-T-E Circuit Breaker Co., Small Circuit Breaker Div., 19th and Hamilton Sts., Philadelphia 30, Pa.

CONDUCTIVE SWITCH LUBRICANT

"Conducto-Lube," a highly conductive lubricant designed for use in conducting-hinge joint switches, is ideal for high-speed air-blast breakers where a lubricant is essential, the manufacturer states. Conducto-Lube can be used on knife blade switches to prevent their "balling up" and "freezing," and its conductivity will reduce resistance and heating. The new lubricant is provided in 6-oz jars at $9.75 and is manufactured by the Conducto-Lube Co., 8603 S. W. 17th Ave., Portland 19, Ore.

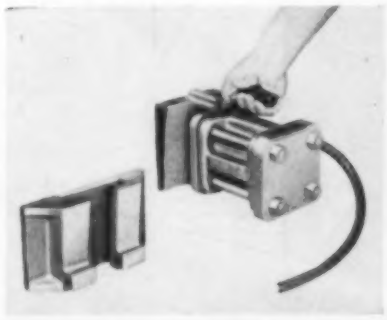


40,000-GPH ELECTRIC PUMP

New Rice 4-in centrifugal pump with 20-hp 3-phase motor is available on pneumatic tires or on skids. On rubber tires the 40-FC weighs 950 lb. The unit is equipped with manual or magnetic-type starter, as desired. The 4-vane non-clogging impeller handles solids to ½ in in diameter. A mechanical seal on the impeller shaft, directly behind the impeller, affords positive and leakproof protection. A spring setting maintains slight pressure on the sealing surface and thereby automatically adjusts the seal to compensate for wear. This positive seal and a self-priming action expands applications for the 40-FC to include the handling of mild chemical solutions, and for cleaning sumps, sludge-tank operations and so on. Descriptive literature from Rice Pump & Machine Co., Belgium, Wis.

PNEUMATIC SPONGE PUMP

Byron Jackson Co. offers a heavy-duty, compact, lightweight pneumatic sponge pump that is ready to go to work by simply connecting it to a 105- or 125-cfm air compressor. No priming is needed. An exhaust pipe prevents muck and water from entering the motor and the length of this exhaust can be extended as required. Pump is easily carried from place to place for varied pumping applications, or other applications involving the pumping of water and other fluids containing sand and abrasives. The BJ 2½-in L pneumatic sponge pump is a vertical, single-stage centrifugal built to operate on compressed air at pressures ranging from 60 to 100 psi and air consumption from 57 to 99 cfm, against heads of 7 to 76 ft and capacities up to 380 gpm. Further details from Byron Jackson Co., Pump Div., P. O. Box 2017, Terminal Annex, Los Angeles 54, Cal.



PORTABLE VIBRATOR

The Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland, Ohio offers its new lightweight portable Type LSRRH vibrator as an unusually well-balanced vibrator suited for heavy-duty use on portable bins, trucks, concrete forms, etc., that do not require permanent vibrator installation. It develops 7,000 to 8,000 vibrations per minute at maximum efficiency and has a sturdy cast-steel bracket for easy attachment.

FILTER BUGGY ENGINEERED FOR ON-THE-SPOT SERVICE

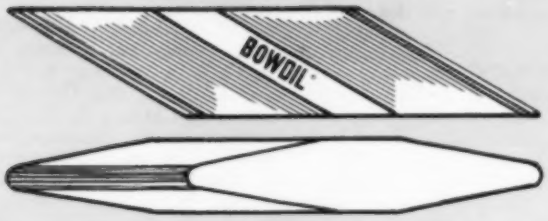
A filter buggy that provides on-the-spot filtration for all hydraulic systems and machines has been developed by Schroeder Bros., 109 Alexander Ave., Greensburg, Pa. The buggy is mounted on either pneumatic or solid rubber tires and can be moved by one man from one area to another. The unit has neither motors nor pumps, instead uses hydraulic power furnished by the machine being serviced. But, it can be bought with pump and motor mounted. A phenolic resin impregnated cellulose filter with a radial fin design provides a filter area of 13,944 sq in. The filter, with an initial particle selection of 10 microns (0.00039), removes particles smaller than white blood cells (25 microns). It will not filter out oil additives nor chemical or water-base flame-resistant fluids. Filtering time is governed by the gpm of the machine pump and the amount of oil in the machine reservoir. Connections are made with couplings. Relief valves with a maximum pressure differential of 40 psi protect the filter elements.

Equipment Shorts You'll Want to Check

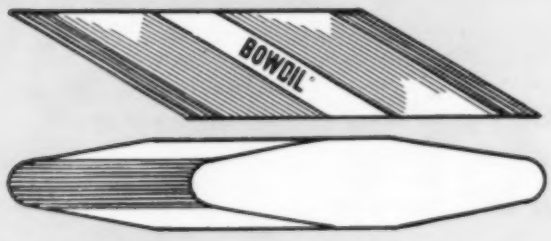
EARTHMOVING AIDS—Front dump buckets and a bulldozer attachment, two types of equipment designed for 15-min installation or removel on Models 2-C, 4-C, 6-C, 7-C and 8-C Austin overshot loaders have been introduced by Austin Div., Central Ohio Steel Products Co., Galion, Ohio. The bulldozer's blade tilts 15 deg on loaders equipped for standard buckets, 45 deg on machines equipped to handle front-dump buckets. The front-dump bucket, termed "live" by the company, is controlled by one double-acting hydraulic cylinder on Models 2-C and 4-C, by two cylinders on Models 6-C to 8-C. Tilt is 45 deg.

FOUR-WHEEL BRAKES — Four-wheel hydraulic brakes, usually installed on large tractor shovels, have been made standard equipment on the Michigan Model 75A manufactured by the Construction Machinery Div. of Clark Equipment Co., Benton Harbor, Mich. The model has a 1-cu yd bucket and weighs 12,750 lb. It is sold with either a 77-hp gasoline engine or an 80-hp diesel, and attains a maximum of 26 mph in forward or reverse. Additional information from the company.

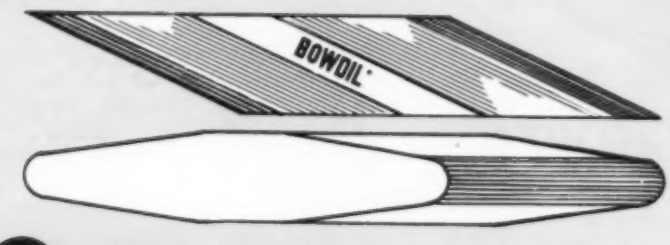
DIESEL REFINISHER—A precision machine tool for refinishing diesel crankpins within the engine without removing the crankshaft is being sold by Aero-Motive Mfg. Co., Kalamazoo, Mich. The machine runs on two split adapters that bolt to crank-cheeks. The machine itself is built in halves, one half carrying cutting bits, the other honing stones.



Series 1-1 **REGULAR DIAMOND BIT, designed for use where cutting conditions are not too severe. Saves power, produces coarse cuttings. 1-1 is MEDIUM Temper, 1-1N1 TOUGH, 1-1N2 HARD.**



Series 1-2 **HEAVY DIAMOND BIT is especially designed for severe cutting conditions (Iron Pyrites and Rock). 1-2 is MEDIUM Temper, 1-2N1 TOUGH, 1-2N2 HARD.**

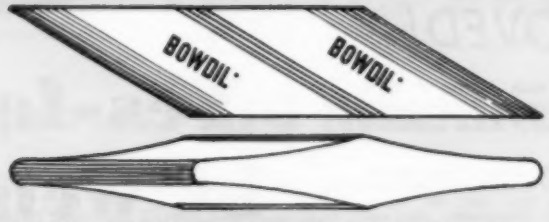


Series 1-6 **LONGWALL BIT is especially designed with a long cutting point for Longwall work. 1-6 is MEDIUM Temper, 1-6N1 TOUGH, 1-6N2 HARD.**

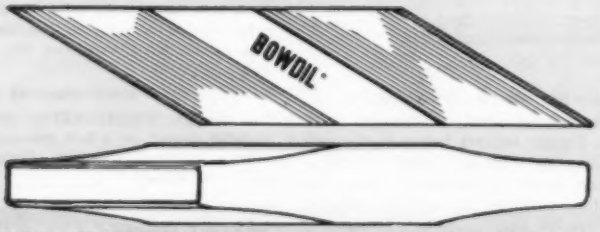
There's a BOWDIL® Bit for every cutting need!

These various types are designed for specific requirements, are made from special alloy steels and are heat treated to three different tempers as listed. Through many years of research on actual conditions in the field, these styles, shapes and hardnesses of Bowdil Bits consistently prove the most popular. We are happy to offer our experience and recommendation for your individual need.

TO HELP YOU RE-ORDER, PLACE YOUR TYPE BIT ON THESE ACTUAL SIZE DRAWINGS



Series 1-11 **REGULAR CONCAVE BIT is designed for the maximum in power savings. Due to the concave shape, side clearance is automatically maintained as the face is worn away, resulting in a more uniform power consumption over the full life of the bit. No. 1-11 is MEDIUM Temper, 1-11N1 TOUGH, 1-11N2 HARD.**



Series 1-29 **HEAVY DUTY CONCAVE BIT has the design features and similar cutting advantages of the Regular Concave, but is made heavier for very severe service. No. 1-29 is MEDIUM Temper, 1-29N1 TOUGH, 1-29N2 HARD.**

ORDER BY NUMBER!

THE BOWDIL CO., CANTON, OHIO

Gentlemen: Rush us

_____ NO. _____ BITS
(Quantity)

Name _____

Address _____

City _____ State _____

THE BOWDIL COMPANY

Boylan Ave. S. E. Phone GLendale 6-7176
CANTON, OHIO

Accuracies of less than 0.001 in roundness and finishes of 32 micro-inches are quickly and easily obtained, the manufacturer says. The machine is available in five sizes for crank-pin diameters of 4 to 20 in.

VIBRATING SCREEN—Detailed information about the Leahy Model E vibrating screen is available in Bulletin 16-EH from Deister Concentrator Co., Ft. Wayne, 1, Ind. Features of the screen, according to the bulletin are an entirely new jacket assembly and mounting concept, a simplified jacket tension adjustment for uniform tautness, and easy, quick mounting and demounting of jackets.

VALVED COUPLING—A valved air and water coupling that automatically seals when disconnected and automatically opens when connected is offered by Snap-Tite, Inc., Union City, Pa. Other features of the "Hi-Flow" are one-piece construction, a 360-deg swivel and elimination of valve seal washout by a bonded valve disc and valve washer.

FREE BULLETINS

MECHANICAL LOADER—Features of its Type 965 trackless loader are described in Catalog G-112 available from Goodman Mfg. Co., Halsted St. & 48th Pl., Chicago 9, Ill. The loader's merits, says the company, are 10 tpm in free coal, 40 hp for loading, 30 hp for tramming and a hydraulic control system.

BELTING TIPS—A wall chart showing proper selection and maintenance of conveyor belting is offered by Hewitt-Robins, Inc., Stamford, Conn. The chart contains 12 maintenance tips for getting more life out of belts.

COAL-RECOVERY DRILL—A new McCarthy underground coal-recovery drill, designed for operation in the restricted space of deep mining, is described in Bulletin M-103, published by The Salem Tool Co., S. Ellsworth Ave., Salem, Ohio. Capable of drilling to depths of 100 ft with 36-in augers, the Model 4-30-36-4 McCarthy drill can be used in recovering lump or nut, and slack coal. Other models use augers up to 60 in in diameter.

PUMPS—Allis-Chalmers two-stage pumps for boiler feed and other high-pressure applications are described in Bulletin 52B6105C. Available in close-coupled and frame-type construction in

COULD FILL 48,000 RAILROAD CARS PER MONTH! Owned by a major coal company, this electric shovel weighs approximately 3,500,000 pounds and has a dipper capacity of about 50 cubic yards. Nevertheless, the mammoth machine is capable of climbing grades steeper than 20%! To help it achieve maximum performance in this grueling work, its owners, after testing nearly every major brand of gear lubricants, chose Cities Service L Compounds for the job. The results have justified this choice.

BIG job . . . BIG machine . . . BIG lubricants!

Gear Oils Of Almost All Major Refiners Were Tested In This Giant Shovel. Cities Service Got The Job.

This giant 50-yard shovel is one of several currently in use by a major coal company. This same company also employs in its strip-mining operation, an extensive fleet of haulage trucks, bulldozers, earthmovers, coal preparation plant equipment, and miscellaneous vehicles.

Not long ago, it was decided to attempt to simplify and standardize the gear oil requirements of this equipment. Following this plan, the company first tested the gear oils of nearly every major refiner. The result: Cities Service L Compounds were chosen to do the job!

Again and again, where there's a big job to be done, mining men turn to Cities Service . . . because they've found Cities Service lubricants do the job better, do it easier. And the same is true of Cities Service Lubrication Engineers. If you have a lubrication problem . . . or if you'd simply like to check the efficiency of your present lubrication procedures, why not call in an expert Cities Service Lubrication Engineer. Simply contact your nearest Cities Service office or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

capacities to 300 gpm at heads from 300 to 550 ft at temperatures to 250 F, the pumps are said to be suitable for boiler feed, humidifier, air-conditioning, high-head-building, and mine service. Included are dimension tables and performance charts. Available from Allis-Chalmers Mfg. Co., 968 S. 70th St., Milwaukee, Wis.

MINE COMMUNICATIONS — The M-S-A "MinePhone," frequency-modulated communications system for underground and surface operations, is described in Bulletin 1601-7 published by Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh, Pa.

EDUCATIONAL FILMS—Four new films have been added to the library of the United States Steel Corp., 525 William Penn Pl., Pittsburgh 30, Pa. In all, 16 subjects are listed in the company's latest catalog. Most are in color, seven are available for television. They are available to associations, clubs and other recognized groups.

POWER SHOVELS—A 40-p bulletin covering its entire line of earthmoving and materials handling machines is offered by the Marion Power Shovel Co., Marion, Ohio. Bulletin 403-C also covers the company's role in power-shovel history. Included is a description of the 60-yd Marion 5760 coal stripper, the world's largest shovel, now under construction.

DRILL BITS—A catalog covering its entire line of drill bits is being distributed by Hoffman Bros. Drilling Co., Punxsutawney, Pa. The catalog lists sizes, setting charges, weights, uses, etc., for all standard bits. A section covers data on miniature prospecting bits, and laboratory bits for specialized industrial use.

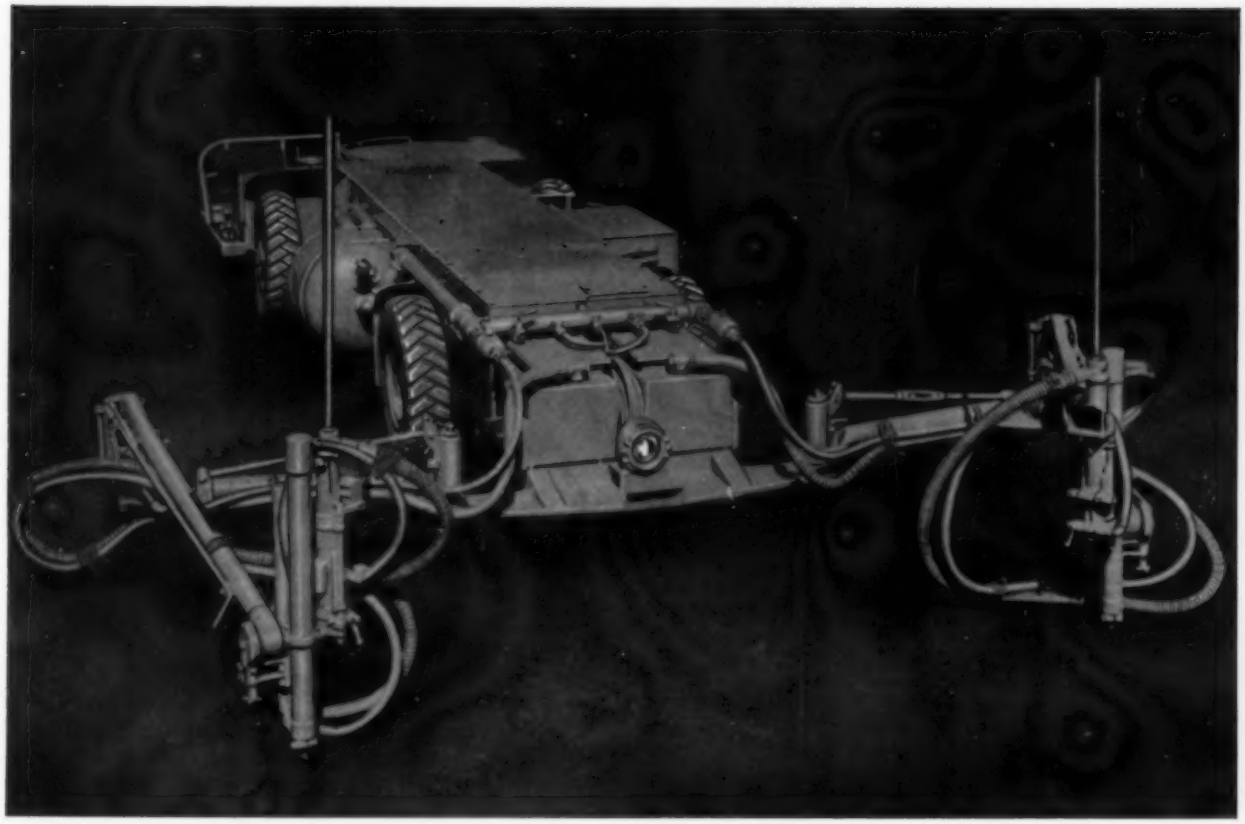
EARTHMOVING UNITS—Booklet entitled "The Challenge" contains numerous case histories showing how successful strip operators are effectively utilizing Caterpillar-built engines and tractors. Specific job applications are detailed, with emphasis on machine features offering high production, low costs and minimum down time. Booklet DE537 from Caterpillar Tractor Co., Peoria, Ill.

MAGNETIC PULLEYS—Bulletin 303-C covering the company line of electromagnetic pulleys and pulley separators, and featuring a simplified pulley-selection method, is available from Stearns Magnetic, Inc., Milwaukee, Wis. The bulletin also describes a two-coil pulley design which creates a magnetic field of increased strength to permit use of smaller-diameter pulleys.

DIESEL ENGINES—The "Cummins Who's Who," a directory of equipment manufacturers that offer Cummins diesel engines as standard or optional power, is available from the Cummins Engine Co., Inc., Columbus, Ind.

WELDING EQUIPMENT—A 16-p catalog features Aircomatic welding equipment and the inert-gas-shielded metal-arc welding process. Manual and automatic units along with accessory apparatus and welding wire are included.

Acme adds 275 Compressor to JUMBOLTER...*for fastest most efficient roofbolting*



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From Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y.

PORTABLE RECORDER—A new price list and specification bulletin on pH recorders and controllers for use with Beckman electrodes and amplifiers is available from the Bristol Co. A new portable pH recorder is featured. The instrument, the maker says, is suitable for stream-pollution studies, or for laboratory use where a permanent installation is not justified. The recorder and an accompanying portable amplifier weigh less than 50 lb. Bulletin Q1305 from The Bristol Co., Waterbury 20, Conn.

MAGNETS—The Ohio Electric Mfg. Co. offers 4-p Catalog 114 on its "Super Magnetomotive" rectangular separation magnets. Performance data and schematic diagrams are included. From the Ohio Electric Mfg. Co., 5400 Dunham Rd., Maple Heights, Cleveland, Ohio.

WASTE CONTROL—A new process data sheet outlines latest developments by Leeds & Northrup Co. for control of pH and redox in industrial waste treatment processes. It includes information on "controllability factors" said to influence automatic measurement and control of pH. Data Sheet, 700 (2), from Leeds & Northrup Co., 4934 Stenton Ave., Philadelphia 44, Pa.

PNEUMATIC APPLICATIONS—The "Ross enginAIR," a new bi-monthly publication covering the air-pressure field, is available from the Ross Operating Valve Co., Fox Bldg., Detroit 1, Mich. In its first issue, the magazine carried articles on fundamentals of pneumatics, air pressure in automation, and an example of a pneumatic application in the assembly of rotor pumps.

TRACTORS—Two tractor models, the "Super 77" and "88" are featured in a new bulletin distributed by the Oliver Corp., 400 W. Madison St., Chicago 6, Ill. Buyers have a choice of gasoline or diesel power. Information on the company's "55" and "99" units is included. Bulletin A-950.

FILTERS—The application of filters is the subject of a new bulletin being distributed by Peterson Filters & Engineering Co., Salt Lake City, Utah. Three types of filter, the disc, the drum and the top-feed reservoir, are featured. In one section the company describes pump refinements through the years.

METAL POWDERS—A folder describing a series of nickel-base alloys being used in hardsurfacing and brazing is available from Coast Metals, Inc., Little Ferry, N. J. Hardsurfacing critical parts and high temperature requirements for brazed joints are featured.

WIRE-CLOTH SCREENS—Practical recommendations for installing wire screens, tips on how to use them economically and illustrated explanations of crimp are three of several features in a 33-p booklet, "Aggregate Wire Screens," available from Hoyt Wire Cloth Co., P. O. Box 22, Lancaster, Pa.

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COAL AGE

NEWS ROUND-UP

W. Kentucky Buys Nashville Coal, Becomes Third Ranking Producer

WITH THE OBSERVATION by its board chairman last month that it was merely following an American trend "toward larger industrial entities," the West Kentucky Coal Co. bought all the stock of the Nashville Coal Co. and became the third largest coal mining organization in the United States. By exchanging $16,000,000 for all of Nashville Coal's five operating mines, river transportation properties and sales companies, West Kentucky had itself a wholly-owned subsidiary and 2½% of the nation's market. It named its new company Nashville Coal, Inc. and was expected to sell 12,500,000 tons of coal a year from estimated reserves of 1,000-000,000 tons. Only two firms would be selling more: Pittsburgh Consolidation Coal Co., 25,000,000 tons, and Peabody Coal Co. of Chicago, 20,000,000 tons.

Long the stronghold of an independent operator and non-union miners, the Nashville Coal Co. had been headed by Justin Potter, who gave West Kentucky Coal, as part of the terms, a long lease on 85,000 acres of land believed to contain 700,000,000 tons of coal. The subsidiary's properties included Miners Coal Co., Williams Coal Co., Stony Point Coal Co., Crescent Coal Co., Uniontown Coal Co., Potter Towing Co., Nashville Coal Co. of Louisville, Nashville Coal Co. of Nashville and several smaller firms. The operating mines have annual capacities of 5,000,-000 tons, the transportation properties and sales companies in the organization annual sales of some 7,500,000 tons.

In announcing the affiliation Sept. 13, Cyrus Eaton, chairman of West Kentucky and its major stockholder, dispelled rumors that his close friend John L. Lewis, head of the United Mine Workers of America, had backed the merger financially. Mr. Eaton said that West Kentucky's directors had authorized a $5,000,000 expenditure for a new mine and that the company had excellent credit. But he confirmed the idea that the UMWA would soon unionize Nashville Coal's 1,400 mine workers. Only one of Nashville Coal's mines had been union-affiliated. At a press conference in Cleveland Sept. 15, Mr. Eaton, said he expected to see the entire western Kentucky coal district organized in a short time under the UMWA.

Generally, the merger was greeted in the industry with satisfaction. Pittsburgh Consolidation congratulated Mr. Eaton praising him for doing the industry a good turn. Mr. Eaton's own remarks about mergers were that coal needs more of them. He said that "there is an urgent need for a number of larger, well-financed units that can spur coal's potential as the fundamental and best fuel." Earlier, he and West Kentucky's president, Hooper Love, had said in a joint press release that the affiliation would develop an aggressive campaign to enable coal to capture a larger share of fuel markets from its oil and natural gas competitors. "Well financed units," they said, "can spur coal."

Also in This Section

Coal Exports Soar Here, Europe Faces Shortage

Overseas bituminous exports continued to soar during August, climbing to a new monthly high of 3,335,412 tons. The new figure brought totals for the first 8 mo. of 1955 to more than 16,500,000 tons.

Coal exporters generally report closing orders well into 1956 and operators generally report a sold-up situation. Tonnage for 1955 will certainly exceed 30 million tons, and may possibly reach 32- to 35,000,000 tons. The limiting factor is the railroads' ability to transport the tonnage rather than any lack of orders or ability to produce.

Coal Age's affiliated publication, *Keystone*, predicts 30- to 32,000,000 tons for 1955, climbing to between 35 and 40 million tons for 1956.

The short-term demand stems from a number of facts:

1. Practically all exported coal is coking gas of metallurgical quality, short in supply everywhere except the United States. Reserves of high-quality coals in Europe are limited and being depleted.

2. Business activity in Europe, especially in West Germany, has increased at a faster pace than coal production has increased.

Continued on p. 114

Major Producers Boost Coal Prices 25 to 45 Cents After Wage Hike

Bituminous coal prices in major producing areas rose 25 to 45c a ton last month while prices as high as 52.1c were being forecast as a result of the $2 pay increase won in August by the United Mine Workers of America. In Pittsburgh, the country's biggest commercial producer, Pittsburgh Consolidation Coal Co., raised its West Virginia and eastern Ohio coals 25c, then advanced standard steam coals 30c and certain grades mined in eastern Kentucky 40c a ton. The Southern Coal Producers' Association reported that the increase in its low volatile field would be 52.1c, 46.4c a ton in the high volatile area.

Meanwhile, Appalachian Coals, Inc., the world's largest coal marketing agency and agent for Kentucky, Tennessee, Virginia and West Virginia producers announced an increase of 40c a ton in addition "to normal seasonal increases."

Despite the increases, there was optimism that sales would not be hurt. George H. Love, Pittsburgh Consol's president, said prices would be "in all instances considerably lower than the 1948 prices for the same grades." Under his company's new schedules coal from northern West Virginia would sell for $4.15 a ton at the mine. Ohio coals would sell between $3.65 and $4.25, depending on quality and size, and western Pennsylvania steam coal would sell from $4.15 to $4.25. Mr. Love pointed out that the new prices merely restored 50% of the price reductions made by bituminous producers in the last 7 yrs.

And although oil men were saying things like "There's nothing like a price increase in coal to cheer up an oil man," they were also saying that coal increases were not high enough to stem the trend away from use of oil. Generally, coal men agreed the oil men were right.

Bituminous Coal Output Still Climbing

YEAR TO DATE	PRODUCTION
Sept. 17, 1955	321,221,000 tons
Sept. 18, 1954	265,239,000 tons

1955 output 21.1% ahead of 1954

A month earlier, through Aug. 20, 1955 output was 20.6% above 1954

WEEK ENDING	PRODUCTION
Sept. 17, 1955	9,970,000 tons
Sept. 18, 1954	8,055,000 tons

Anthracite Steady

YEAR TO DATE	PRODUCTION
Sept. 17, 1955	16,994,000
Sept. 18, 1954	18,565,000

1955 output 8.5% under 1954

WEEK ENDING	PRODUCTION
Sept. 17, 1955	562,000
Sept. 18, 1954	532,000

COAL EXPORTS . . . From p 112

3. Great Britain's nationalized coal industry can no longer satisfy its own demand much less foreign markets. Great Britain has announced that coal exports in 1956 would be sharply reduced, perhaps as much as 50%.

4. Belgium may lose her export market and perhaps become an important importer because high production costs may cause her to abandon many mines.

5. Russia's dominance in Manchuria has cut off that country as a supply for far eastern countries. Russia's own supplies barely satisfy her own requirements.

Strong efforts are being made to convert Europe to an oil economy, but such conversion cannot be made in a few years. Most American coal moving to Europe (outside England) is of metallurgical quality. It is in short supply world-wide (except in the U.S.A. and Canada), and cannot be replaced by oil.

There is a possibility that America's export demand will continue in the 30- to 40,000,000-ton range for quite a few years ahead. Western Europe's energy consumption is expected to increase at a rate of better than 2% per year. Gas is not available. Neither hydro nor oil can take up the slack. Neither will nuclear energy enter the picture to any extent before 1960.

Faced with the necessity of increased energy supplies to maintain an expanding economy, Europe may find it possible to increase her own coal production by making tremendous investments in new mines, new equipment and new techniques.

Strike Hits Chattanooga Field; Operators Blame Stiff TVA Terms

Although directed against two large coal producers and six independent operators, a strike of 5,000 miners in fields near Chattanooga, Tenn., last month seemed aimed at the Tennessee Valley Authority and its coal buying policies. The chain of circumstances went this way: The miners idled 200 mines Sept. 8 after most independents had failed to boost pay in line with the recent $1.20 raise won by the United Mine Workers of America. Among the strike-bound were the fields two big operators, Tennessee Products & Chemical Corp., Nashville, and Tennessee Consolidated Coal, Tracy City. Both operators had given the wage increase to their mechanized mines, but many independent operators leasing or contracting with the big two had not. As a result the miners walked off the job in the entire field.

A UMWA spokesman, George Gilbert, said that many of the independents had agreed to put the wage increase into effect if the two large operators would increase the price paid for coal they bought from the independents. A 40c increase was asked. Tennessee Products, replying through Carl McFarlin, a vice president, said his firm had offered 15c a ton and could not afford 40c. He said that about one-half the contracts Tennessee Products held with TVA permitted only a "1c increase in the price TVA pays us for coal for each 10c increase in miners' pay." The remaining contracts, he said, had been tied to a price commodity index that allowed "very little" increase in coal prices because of increased wages. Everett Roberts, general superintendent of Tennessee Consolidated described a similar situation.

Both the UMWA and mine operators have assailed the TVA for its coal buying policies. Both have protested that the TVA does not permit enough allowance in coal contracts to cover wage increases.

Mark 50 Yr in Coal Mining

TWO ADDITIONAL EXECUTIVES whose contributions to coal mining go back 50 yr or more are Jesse Redyard (left), president and general manager, Redyard Coal Co., and C. L. Wilson, safety engineer, New River & Pocahontas Consolidated Coal Co. *Coal Age* will welcome additional nominations to its "Half-Century Club" of any man with 50 yr or more of service who is still active in a managerial or supervisory capacity.

Jesse Redyard
President and General Manager
Redyard Coal Co.
Pineville, W. Va.

Mr. Redyard started in the mines as a trapper boy when 10 yr old. With the exception of 2 yr in the army during World War I he has spent his life in and around mines and has never suffered a lost-time accident. Upon his return from France in 1919 he resumed his former job as fireboss for the Central Coal & Coke Co., at No. 10 mine, Hartford, Ark.

Beginning in 1920, Mr. Redyard served 6 yr as Arkansas state mine inspector and then joined the U. S. Bureau of Mines in the Safety Training and Accident Prevention Div. under J. J. Forbes. After 3 or 4 yr of this work and covering several states he became safety director for the New River & Pocahontas Consolidated Coal Co.

In 1929, following 10 yr with New River & Pocahontas, Mr. Redyard became safety director of the Kopperstone Div. (W. Va.) for Eastern Gas & Fuel Associates. Then after a hitch as assistant safety director of the Island Creek Coal Co., he was appointed chief of the West Virginia Department of

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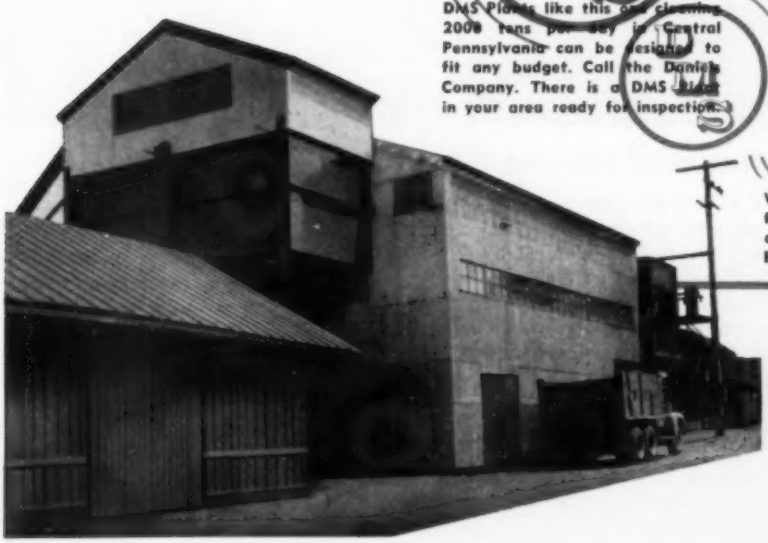

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News Briefs and Trends

Coal Committee to Study Atom Effect on Industry

The nation's bituminous industry last month established a special committee to study the influence of atomic energy on operations of the industry.

L. C. Campbell, president of National Coal Association and vice president of Eastern Gas & Fuel Associates, Pittsburgh, Pa., said that K. A. Spencer, president of Pittsburg & Midway Coal Mining Co., Kansas City, Mo., will serve as chairman of the NCA's Atomic Energy Committee. Its other members are L. Russell Kelce, president, Sinclair Coal Co., Kansas City, Mo.; R. H. Knode, chairman of the board, Stonega Coke & Coal Co., Philadelphia, Pa.; George H. Love, president, Pittsburgh Consolidation Coal Co., Pittsburgh; A. R. Matthews, president, Pocahontas Fuel Co., Inc., Pocahontas, Va.; M. L. Patton, vice president, Truax-Traer Coal Co., Cincinnati, Ohio; R. E. Salvati, president, Island Creek Coal Co., Huntington, W. Va.

Mr. Spencer scheduled the first meeting for Oct. 6, at Bluefield, W. Va., where Philip Sporn, president of American Gas and Electric Co., New York, was to speak on atomic energy and the coal industry. He was scheduled to report on the Geneva Atoms-For-Peace Conference in which he participated.

The coal industry's committee will examine present programs of the Atomic Energy Commission for the generation of electric power from nuclear fuel and evaluate the influence of these programs on the bituminous industry.

The committee is also charged with the responsibility for formulating a policy with regard to atomic energy.

It will consider industry participation in the work of The Panel on the Impact of the Peaceful Uses of Atomic Energy, created last March by Sen. Clinton P. Anderson, chairman of the Joint Committee on Atomic Energy. The panel has begun its study and is scheduled to report to the Joint Committee Jan. 31. Sen. Anderson has indicated that its report will be the basis for drafting legislative recommendation to Congress in line with the Atomic Energy Act of 1954.

The coal industry is vitally concerned because the Joint Committee and the panel both regard the generation of electric power by nuclear fuel as one of the fields of greatest promise for the peaceful atom. This year some 120,000,000 tons of coal are being supplied electrical utilities for power generation.

Republic Steel Reveals Plan For 16% Expansion Program

Republic Steel Corp. revealed last month that it planned to increase its steel-working capacity by 16%. The move is the most ambitious yet made by Republic, the nation's third largest steel producer. The expansion is expected to increase the company's capacity from 10,262,000 to 11,880,000 tons a year. A program of enlarging finishing mill facilities, open hearth and electric furnace at plants in Cleveland, Warren and Youngstown, Ohio, and Gadsden and Chicago, Ala., will cost the company about $130,000,000.

UMWA Levies $20 Assessment

Because it is "constantly beleaguered by many lawsuits," the United Mine Workers of America disclosed last month it was assessing employed soft-coal miners

MARK 50 YR . . . From p 114

Mines in 1942. Since 1945 he has devoted full time to operation of the Redyard Coal Co., which he and his sisters, Nora and Dora, own.

C. L. Wilson
Safety Engineer
New River & Pocahontas Consolidated Coal Co.
Minden, W. Va.

Mr. Wilson spent his early career as a trapper and mine-car greaser in mines at Piney Fork and Harpersville, Ohio, and later was a trapper underground for mule haulage at Kings Mine in Ohio, and was a trapper for locomotive haulage at Namonia, Pa. At the Castle Shannon mine (Pa.) from 1913 to 1916, he was engaged in several phases of mine work, including fireboss and assistant mine foreman. In 1917 he was employed as assistant mine foreman for Carters Coal Co., Cannonsburg, Pa.

From 1918 to 1921, while residing at Castle Shannon, Pa., Mr. Wilson loaded coal at night and completed a college course at Carnegie Institute of Technology. During 1922 to 1924 he served as a mine inspector for Compensation Rating Inspection Bureau and was on his way to inspect the Spangler mine when it exploded. He assisted in recovering all the bodies.

Since 1925 Mr. Wilson has held his present position with the New River & Pocahontas Consolidated Coal Co. (Berwind, Caples, Minden and Havoco mines in West Virginia), and he handles the same department for the Kentland Elkhorn Coal Co., Dunlap, Ky. He has mine foreman's certificates in West Virginia, Pennsylvania and Kentucky, and is a registered professional engineer in West Virginia. In 1946, Mr. Wilson was on the outside changing shoes at the Havoco mine preparatory to entering the mine to make an inspection when the mine exploded. There again he assisted in the recovery work, as he has done at various disasters.

National Council Cites P&R For Safety Record

THE FIRST AWARD known to have been made by the National Safety Council to an anthracite coal company has been presented to Philadelphia Reading Corp.'s St. Nicholas central breaker for having operated without a disabling injury during 1954. The award was the highlight of safety presentation ceremonies, during which the Holmes Safety Association's certificate of Honor also was awarded to the St. Nicholas central breaker. Other Holmes certificates went to P&R's Shen-Penn and Wadesville strippings for operating without a fatality. Attending the presentation ceremonies were: (left to right) E. H. McCleary, district engineer, USBM; John E. Reilly, president, Local 1886, UMWA; Edward Haskins, general foreman, Wadesville Production Co; F. W. Chesney, president, Shen-Penn Production Co; Joseph Petusky, superintendent, Shen-Penn Production Co; James Creedon, president, Local 113, UMWA; George A. Brecker, chief safety engineer, P&R; Walter Juck, president, Local 1685, UMWA.

$20 each. The money would be paid in $5 installments in September, October, January and a pay period after April, 1956. The UMWA *Journal* said the money is needed to help fight "huge organized financial groups" that would like to destroy the union. Some $4,000,000 is expected from the assessment. The union's treasury is a reported $40,000,000.

Wage Order Protests Filed By Non-Union Operators

A number of non-union operators in Kentucky and West Virginia filed protests last month against Secretary of Labor James P. Mitchell's Aug. 3 order for minimum wages among operators that were mining bituminous coal on government contract. The effective date of the order, Sept. 6, was the deadline for filing objections. The Secretary had proposed wages comparable to the levels paid UMWA miners. Objections were also filed by member of the Central Pennsylvania Open Pit Mining Association, the Independent Coal Producers Association, and Stearns Coal & Lumber Co. The next step will be a review of the protests and a final order from Secretary Mitchell.

Arizona Power Executive Sees Bright Future For Coal

Walter T. Lucking, president of the Arizona Public Service Co., forecast a bright future for coal when he addressed members and officers of a Phoenix, Ariz., club. Mr. Lucking said that coal is Arizona's most promising prime source of cheap power and added that he believed hydro-carbon by-products of coal would prove better than those in oil for making plastics as well as a source of electric power. As a power supply executive, Mr. Lucking envisioned a partnership of electric power utilities and chemical companies, one extracting coal's by-products, the other burning the waste as an electric power source.

Ohio Mine Scheduled To Begin Operations This Month

A new bituminous mine near Bridgeport, Ohio, expected to employ 300 to 400 men, was scheduled to begin operating Oct. 1. The owner, Lorain Coal & Dock Co., has estimated the mine's 4,000 acres of coal should last 40 yr. The mine will replace diminishing coal supplies of two other mines being operated by the company near Blaine, Ohio.

EG&FA Begins Construction Of Helen, W. Va. Mine

Preliminary construction of a new mine in Helen, W. Va., Stotesbury No. 10, was begun in August by the Coal Div., Eastern Gas & Fuel Associates. The mine is expected to produce 1,000 to 1,500 tpd when it reaches full production early in 1956. H. John Harper, general manager of mines for Eastern, said a highly mechanized operation, with a virtual uninterrupted flow of coal from the face to the cleaning plant, is planned.

New Watts Mine to Open

Several hundred acres of land near Hinton, W. Va., have been leased for deep mining by the Watts Fuel Co. George Watts, president of the company, said that some 100 men would be employed in the mine and that 500 to 700 tpd would be loaded beginning next spring. The entire output, he said, would be purchased by the Massey Coal Co., Richmond, Va. Construction of a new tipple on the site of an old fairgrounds in Hinton was expected to begin immediately. The Chesapeake & Ohio Railway has plans for a ten-car siding. Mr. Watts operates the Hominy Creek-Sewell Coal Co., near Ruppert, W. Va.

3 Companies Convert to Coal

Two power companies and one industrial plant in three Atlantic seaboard cities have converted either entirely or in part from oil to coal. In New York, the Long Island Lighting Co. has cut its oil purchases 80%. In Philadelphia, an industrial plant, converting completely, stopped buying 1,000,000 bbl of oil a year. And in Boston the Edison Co., switching to coal in one plant, stopped buying 500,000 bbl of oil.

Operator Denies UMWA Need Two More Sue For $600,000

As a non-union Kentucky coal operator executive criticized the UMWA's new notice of intent to organize miners in Clay and Leslie Counties last month, two of Kentucky's independent operators from Pike County were asking $600,000 damages from the UMWA and John L. Lewis in Alexandria, Va., circuit court. The executive's criticism came from Joe B. White, of the New White Coal Co. and the Courtesy Coal Corp. Mr. White, once mayor of Manchester, Ky., said that miners were satisfied with the wages they

Continued on p 132

Personal Notes

John Schwartz, former superintendent at Maitland, Eastern Gas & Fuel Associates, has been named mine foreman on 5 Right Side of Keystone mine. **W. L. Laxton** has been transferred to Pinnacle and Carswell side as mine foreman, **Coy McPeake** has been reemployed as section foreman and **Ed Sheriff** has been transferred from Stotesbury No. 8 engineering department to Helen mine where he will assume the job of resident engineer.

Carroll A. Garner, a vice-president of Jeddo-Highland Coal Co., Jeddo, Pa., has resigned as vice president in charge of operations, a post he has held since 1937. He was succeeded by **Wilmot C. Jones,** vice president and general superintendent. Mr. Garner had been with Jeddo-Highland 34 yr. As a prominent member of the anthracite industry, he served as a member of its wage negotiating committee and its Committee of Twelve. As a vice president of Jeddo-Highland he was in charge of Hazle Brook Coal Co., Raven Run Coal Co., Jeddo Tunnel Co. and Jeddo Supply Co.

Guy E. Conner, a mine foreman of Loree Division, The Hudson Coal Co., Scranton, Pa., retired Aug. 31 after 57 yr of service. An official of Hudson Coal for 45 yr, Mr. Conner advanced from slate picker through a number of jobs. He worked at Delaware, Pine Ridge and Laurel Run collieries until 1943, when he was named mine foreman of Loree collieries. The third generation of Conners to work for Hudson. Mr. Conner expects to spend much of his retirement leisure hunting and fishing. His son, Ervin, assistant superintendent of Loree, is carrying on the family tradition of working for Hudson Coal.

J. Walter Hurley of Beckley, W. Va., a former vice-president of production for North American Coal & Dock Co., has been appointed mining consultant for the North American Coal Corp. Mr. Hurley left the post of vice-president 11 months ago because of illness. In his new job he will be consultant for Ohio and West Virginia mines. Mr. Hurley launched a career in coal more than 40 years ago when he worked as a trapper boy and spragger for Mohawk Coal & Coke Co., Mohawk, W. Va. During that career he became purchasing agent for the Thacker Coal & Coke Co., Thacker, W. Va., cashier for the Pocahontas Coal Co., a subsidiary of Thacker, and efficiency executive for Koppers Coal Co. This was followed by the job of safety director with the Red Parrot Coal Co., Prenter, W. Va. Then the job of superintendent of Red Parrot's Red Cedar mine near Whitesville, W. Va. Four years ago Mr. Hurley was appointed general superintendent of C. H. Mead Coal Co. mines at East Gulf. In 1953 he was elected vice-president of production for North American Coal & Dock Co. mines in West Virginia. It was from this post that illness forced a temporary retirement 11 months ago.

Two new administrative jobs were created and filled last month by the Pocahontas Fuel Co., Pocahontas, W. Va. **J. W. Pero,** veteran mining safety man, was appointed director of safety and mine inspection, while **William Maratta,** an administrative assistant to the president, was installed as director of plans and development. Mr. Pero was with the United States Bureau of Mines from 1936 to 1942 as a senior safety instructor. Later, he organized safety inspection and the personnel department for the Christopher Associates, Inc., in northern W. Va. He joined Pocahontas Fuel in 1943 as safety engineer, later became production manager. Mr. Maratta joined the fuel company in 1953. Before that

NOW...a new LONG development

for faster, easier conveyor moves...

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self-tramming
CONVEYOR DRIVE

It's this easy to move the LONG Conveyor Drive

Reduces moving time by as much as 60%!

With this unique mobile unit, conveyor moves are greatly simplified—and can be made in only a fraction of the time formerly required.

Because this LONG conveyor drive is crawler-mounted and self-tramming, one man can move it to a new location in a matter of minutes without any trouble or effort whatsoever. In addition, positioning time is greatly reduced as this can be done by power instead of manually.

For tramming, this new design uses a simple hydraulic system driven by the conveyor motor itself. Tramming speed is approximately 50 feet per minute, capacity of 5 TPM is standard, and operating lengths to 500 feet are practical. Models are available in a full range of capacities to meet individual requirements and are furnished with either LONG standard or solid return-trough pans.

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The **LONG** Company
OAK HILL, W. VA.

America's foremost manufacturer of chain conveyor equipment

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Wholesale Staff Changes Follow Island Creek Merger

Near-wholesale promotions and shifts in key personnel were disclosed Sept. 3 by the Island Creek Coal Co., Holden, W. Va., as the company revealed that the Pond Creek Pocahontas Co. had been merged with Island Creek. The major job changes were these: **Nicholas T. Camicia,** formerly general manager of Pond Creek Pocahontas, was appointed general manager of mines with headquarters at Holden. **Hubert H. Barber,** general manager, became assistant to the vice-president of operations for labor and public relations. **W. F. Diamond,** formerly Island Creek chief engineer, became assistant to the engineering vice-president. **F.C. Menk,** director of engineering, became engineering consultant to the vice-president of operations. **W. W. Reed,** director of purchases, was named manager of purchases. Island Creek's three divisions, the company reported, will be headed by these men: Rockhouse Div., **L. G. Barber,** manager, and **J. O. McNeil,** assistant manager; Holden Div., **R. M. Johnson,** manager, and **M. M. Marchich,** assistant manager; Bartley Div., **D. E. Bayer,** manager, and **R. H. Tinsley,** assistant manager. In other personnel shifts, the company promoted

M. M. MARCHICH

D. E. BAYER

R. H. TINSLEY

S. M. DAMERON

S. M. Dameron, maintenance and construction superintendent, to director of maintenance. **Roscoe Garrett** was made director of construction, **Clyde Dickenson** was promoted from mine foreman to superintendent, No. 6 mine; **O. L. Childress** from mine foreman to superintendent of the Marianna Mine. **Curtis Brooks,** an assistant mine foreman was moved up to mine foreman; **T. A. Salvati** was promoted from assistant superintendent to superintendent; **Walter DeBord** was transferred from superintendent of the Marianna mine to superintendent of Mine No. 27; and **Alex Matney** was transferred from superintendent, Mine No. 28, to superintendent, Mine No. 25. **Jack Adams,** superintendent of No. 25 Mine, was transferred to No. 24 as its superintendent. The company said that the organizational changes were designed to integrate the two companies and implement Island Creek's modernization and expansion program.

ROSCOE GARRETT

Personal Notes Continued . . .

he worked for Clinchfield Coal Corp. and the Lillybrook Coal Co.

George T. Gillison was appointed chief mine inspector of the Gary District mines owned by United States Steel Corp., Gary, W. Va., last month. Mr. Gillison began working for the steel company at Danville, Ill. In 1949 he moved to Gary as ventilation inspector.

In other promotions at Gary, **L. P. O'Brien** was moved from mine foreman, No. 2 mine, to general mine foreman, No. 10 mine; **Willis Powell,** from assistant general mine foreman to mine foreman, No. 2 mine; and **Charles Clemos,** from assistant mine foreman to assistant general mine foreman, No. 2 mine.

Association Activities

Matthews Appointed To Fill Unexpired Coal Research Term

A. R. Matthews, president of Pocahontas Fuel Co., Inc., Pocahontas, Va., has been appointed to fill the unexpired term of Ralph E. Jamison Jr., Greensburg, Pa., as director of Bituminous Coal Research, Inc. Mr. Jamison resigned the post after he sold the Jamison Coal & Coke Co. The director term expires April, 1956.

Joseph T. Bert Elected NCA Vice President

Joseph T. Berta, president of Pittston Clinchfield Coal Sales Corp., New York, was elected vice president of the National Coal Association Sept. 9 at a directors' meeting in White Sulphur Springs, W. Va. Mr. Berta succeeds Ralph E. Jamison Jr., Greensburg, Pa. The NCA board also elected Charles A. Owen, chairman of Imperial Coal Corp., New York, a director-at-large.

Sonman Mine's 99.450 Score Wins Pennsylvania First Aid Meet

Sonman mine, Eastern Gas & Fuel Associates, won first place in the 13th Annual State First Aid Contest of the Pennsylvania State Bituminous Safety Association Sept. 10 at Carmichaels, Pa. Led by F. Frytak, Sonman's first aid team scored 99.450 to defeat 17 competing teams and win a $350 award and the Mine Safety Appliances Co. trophy. Second place was won by the Mathies mine of the Mathies Coal Co. A $175 award and a UMWA trophy was presented to J. Hebda, captain, and the Mathies team for its score of 99.200. Third place and $140 went to the Cardiff mine, Imperial Coal Co., for its score of 99.1502. L. Kimmel captained the team and accepted a National Coal Association trophy. Fourth place was won by the Mather mine team, Mather Collieries, which scored 99.1501, a fraction less than Cardiff's score. The Mather team won $105 and was awarded safety lamps.

MEETINGS

Lubrication Activity Group of the American Society of Mechanical Engineers and The American Society of Lubricating Engineers; 2nd Lubrication Conference, Oct. 10-12, Antlers Hotel, Indianapolis, Ind.

National First Aid and Mine Rescue Contest, USBM; Oct. 10-12, Knoxville, Tenn.

American Coke and Coal Chemicals Institute: Annual Meeting, Oct. 17-18, The Greenbrier, White Sulfur Springs, W. Va.

National Safety Council; National Safety Congress, Oct. 17-21, Conrad Hilton Hotel, Chicago, Ill.

American Institute of Mining & Metallurgical Engineers, American Society of Mechanical Engineers; Joint Fuels Conference, Oct. 19-21, Neil House, Columbus, Ohio.

Illinois Mining Institute; 63d Annual Meeting, Oct. 28, Hotel Abraham Lincoln, Springfield, Ill.

Kentucky Mining Institute; annual meeting, Nov. 10-11, Phoenix Hotel Lexington, Ky.

West Virginia Coal Mining Institute and Central Appalachian Sec., AIME; joint meeting, Nov. 11-12, Greenbrier Hotel, White Sulphur Springs, W. Va.

Obituaries

Henry G. Turner, 55, superintendent of O'Donnell mine, the Rochester & Pittsburgh Coal Co., died Aug. 18 in Four States, W. Va., after a heart attack. Mr. Turner had been ill several months. Before moving to Four States 6 yr ago, Mr. Turner had been employed by the Consolidation Coal Co. in West Virginia and Kentucky and by the Christopher Coal Co. at Morgantown, W. Va.

James A. McQuail, 74, retired coal operator and resident of Bluefield, W. Va., since 1902, died in Smyrna, Del., Aug. 24. At the time of his retirement Mr. McQuail was the oldest active operator of the original coal operators that had developed the Pocahontas Coal fields. After moving to Bluefield from his home town of Pottsville, Pa., Mr. McQuail joined his father and brother operating the Turkey Gap Coal Co.

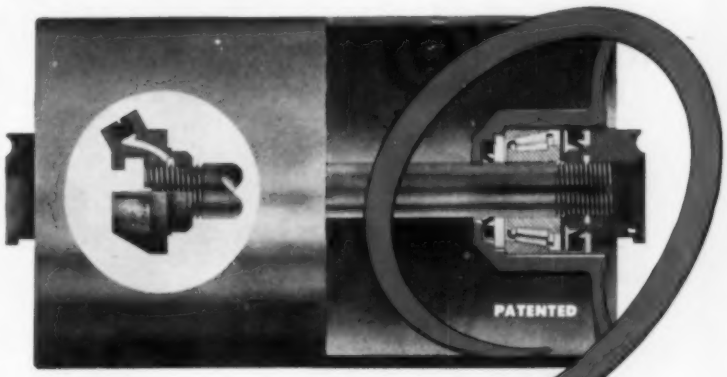
Robert L. Birtley, president of the Kohinoor Coal Co., Shenandoah, Pa., died in Locust Mountain Hospital Aug. 26. Mr. Birtley, who lived near Scranton, Pa., was a well-known anthracite operator. He was president of the Hammond Coal Co. and a member of the Anthracite Wage Negotiating Committee. He had also been an original trustee of the Anthracite Health and Welfare Committee.

Ralph Coolidge Mulligan, 67, a former director of public relations for the National Coal Association, died in his Washington home Aug. 25. Mr. Mulligan retired Oct. 1, 1954, ending a career in

UST* Continental Idlers

*** UNIT-SEALED PRE-LUBRICATED TIMKEN BEARINGS**

Saves Grease!
Saves Labor!
Saves Belts!



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CGC PRE-LUBRICATED
CGC TIMKEN BEARINGS

Continental's Unit-Sealed "UST" Conveyor Idlers, incorporating Timken Bearings, Garlock Klozures, are the answer to the operator's prayer.

The Unit Bearing Assemblies—"sealed unto themselves" provide an ample but not excessive grease reservoir. This represents a saving of grease and further eliminates any possible migration of the grease from upper to lower bearings on inclined rolls. The lubricant is a top quality water repellent grease of a stable consistency with a wide temperature range for long life.

Most important—this construction permits operating the Continental "UST" Idler without relubrication for 1-2-3 years depending upon the severity or character of conditions.

For detailed information on these idlers write for Bulletin CA-116.

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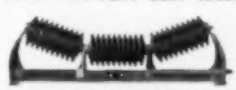
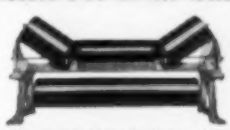
SELF-ALIGNING FLAT BELT IDLER



RUBBER DISC IMPACT IDLER



GRAIN CONCENTRATION IDLER

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Long Life- **THE ULTIMATE IN MINIMUM MAINTENANCE**

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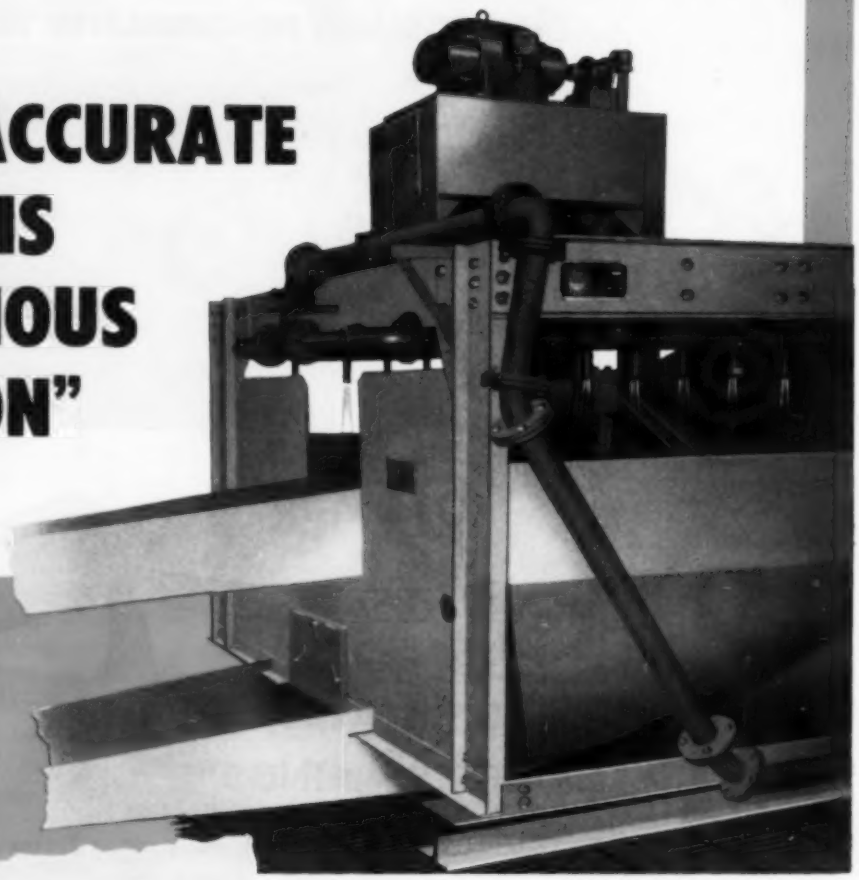
"MOST ACCURATE IN THIS BITUMINOUS REGION"

says Crichton Coal President



"...Your precision Wilmot-OCC Vessel and the fine cooperation of your staff have combined to give us an outstandingly effective preparation system.

"We consider our heavy-media preparation plant to be the finest, most accurate and easily controlled in this bituminous region. Our tipple foreman calls it 'a beautiful machine'.

"After thirty days of preliminary operation at different specific gravities, we are now holding this at 1.47. The results, for example, for the last five days were: 6.44, 6.25, 6.28, 6.17 and 6.24 for an average ash percentage of 6.28. This gives us what, for our market, is a very acceptable ash percentage. Our customers include some of the largest utilities, industrial firms and institutions in the East."

Above is pictured one of the newly-introduced Wilmot-OCC heavy-media vessels in the plant of Crichton Coal & Coke Co., Johnstown, Pa. At the left is a portion of a letter from Mr. A. B. Crichton, Jr., President. To evaluate the substantial engineering advances introduced by the new Wilmot-OCC heavy-media vessel, we invite you to send samples for testing or visit our commercial size HM pilot plant and laboratory at White Haven, Pa.

Models in 8 sizes, ½ tph to 400 tph, coal or ore.

W WILMOT

WILMOT ENGINEERING CO.

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Plant:
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the bituminous coal industry that had spanned nearly 30 yr. In 1924 and 1928 Mr. Mulligan was editor of the Daily News Bulletin published by the Republican National Committee in support of its campaigns. With the NCA Mr. Mulligan worked against public power and federal government competition with the fuel industries. He was director of NCA's Priorities and Procurement Div. during World War II. In 1946 he became director of public relations for the Bituminous Coal Institute.

A. Finley Harper, 62, a former member of the Alabama Safety Commission, died in a Birmingham hospital Sept. 14. As a mining engineer, Mr. Harper had been associated with Sloss-Sheffield, Woodward Iron Co. and the National Coal & Coke Co. He was appointed to the Alabama safety post in 1949 and served until his retirement in 1953.

Preparation Facilities

Tasa Coal Co., Freemont mine, Cadiz, Ohio.—Contract closed with Fuel Process Co., for two-track tipple, including shaker screen and crusher loading booms, to handle 200 tph, R-O-M.

Franklin Hydrotated Coal Co., Ravine, Pa.—Shipment by the Deister Concentrator Co. of two SuperDuty Diagonal-Deck No. 7 coal-washing tables for cleaning No. 5 buck size anthracite.

United States Pipe & Foundry Co., Maben, Ala.—Shipment by the Deister Concentrator Co. of seven SuperDuty Diagonal-Deck No. 7 coal-washing tables and one 8-cell Concenco SuperSorter for classification of table feed.

Text of 1955 Wage Pact

Most of the bituminous industry began operations Sept. 1 under the provisions of the 1955 National Bituminous Coal Wage Agreement. Here is the full text of the agreement.

"Whereas on September 29, 1952, and at various dates subsequent thereto, certain coal associations, companies and individuals (generally referred to as 'Operators'), in their association, company and individual names and capacities, executed with the United Mine Workers of America an Agreement denominated 'National Bituminous Coal Wage Agreement of 1950 As Amended September 29, 1952'; and said Operators, signatory to this Agreement, have now negotiated with the United Mine Workers of America certain additional amendments to said 'National Bituminous Coal Wage Agreement of 1950' and it is the agreement and intent of all parties hereto to amend and supplement and as amended and supplemented to carry forward and preserve the terms and conditions of said 'National Bituminous Coal Wage Agreement of 1950 As Amended September 29, 1952', said 'National Bituminous Coal Wage Agreement of 1950', and all previous Agreements as therein provided:

"Now, therefore, this agreement, effective September 1, 1955, by and between the coal operators, associations, com-

COAL MEN ON THE JOB . . .

LECKIE ASSOCIATED MINES, Bluefield, W. Va.—Lee J. Brown, (left) draftsman; C. A. Watts, construction engineer; and W. W. Coleman, chief engineer.

panies and individuals signatory hereto and by and between such other and additional associations, companies and individuals as may hereafter become signatory hereto (hereinafter referred to as 'Operators'), as parties of the first part, and the International Union, United Mine Workers of America (hereinafter referred to as 'Mine Workers') on behalf of each member thereof, as party of the second part, covering all of the bituminous coal mines owned or operated by said first parties, amends, modifies and supplements and, as amended, modified and supplemented, carries forward and preserves the terms and conditions of the 'National Bituminous Coal Wage Agreement of 1950 As Amended September 29, 1952', the 'National Bituminous Coal Wage Agreement of 1950', and all previous Agreements as therein provided, such amendments, modifications and supplements being as follows, to wit:

Wages and Hours

"Amend the 'Wages and Hours' section of the National Bituminous Coal Wage Agreement of 1950 by striking out the present language of subsection (d) of said section and substituting the following:

"'(d) All mine workers, whether employed by the month, day, or tonnage, yardage, deadwork or footage rate, shall receive, effective September 1, 1955, Nine Dollars and Forty-five Cents ($9.45) per day in addition to that provided for in the contract which expired March 31, 1946, and effective April 1, 1956, Ten Dollars and Twenty-five Cents ($10.25) per day in addition to that provided for in the contract which expired March 31, 1946.'

"Amend the 'Wages and Hours' section of the National Bituminous Coal Wage Agreement of 1950 by adding a new subsection to read as follows:

"'(j) Work performed on Saturday shall be paid for at time and one-half or rate and one-half. Work performed on Sunday shall be paid for at double time or at double rates. The operator shall have the right to schedule maintenance crews, power house and sub-station employees, pumpers, lamp house and bath house men, firemen, fan attendants,

switchboard operators and other similar employees for Saturday and Sunday work and schedule their days off during the first five days of the work week (except continuous hoisting engineers as now provided in subsection (c) hereof). However, such employees shall be given the opportunity to work the same number of days per week as the number of days on which the mine produces coal, and shall be given equal opportunity to share the available work on premium days."

Vacation Payment

"Strike out the first and second printed paragraphs and insert in lieu thereof the following:

"'An annual vacation period of twelve (12) consecutive calendar days shall be the rule of the industry. From Thursday, June 28, 1956 to Monday, July 9, 1956, inclusive, shall be a vacation period during which coal production shall cease. Day men required to work during this period at coke plants and other necessarily continuous operations or on emergency or repair work shall have vacations of the same duration at other agreed periods.

"'All employees with a record of one year's standing (June 1, 1955 to May 31, 1956) shall receive as compensation for the above mentioned vacation period the sum of One Hundred Forty Dollars ($140), with the following exception: Employees who enter the armed services and those who return from the armed services to their jobs during the qualifying period shall receive the $140 vacation payment.'"

Termination of Agreement

"Amend the 'Termination of Agreement' section of the National Bituminous Coal Wage Agreement of 1950 by striking out the present language and inserting in lieu thereof the following:

"'This Amended Agreement, dated August 20, 1955, shall be effective as of September 1, 1955, and is not subject to termination by any party signatory hereto prior to August 31, 1956, PROVIDED, HOWEVER, That either the parties of the first part or the party of the second part may, on or after August 31, 1956, terminate this Agreement by giving at least sixty (60) days' written notice to the other party of such desired termination date.'

"In witness whereof, each of the parties signatory hereto, pursuant to proper authority, has caused this Agreement, effective September 1, 1955, to be signed by its proper officers or representatives at Washington, D. C., on this twentieth day of August, 1955."

Fire Standards Proposed For Mine Conveyor Belts

Because a number of mine fires have involved conveyor belts the Bureau of Mines is getting ready to issue standards for testing belts for fire-resistance, Secretary of the Interior Douglas McKay announced Sept. 14.

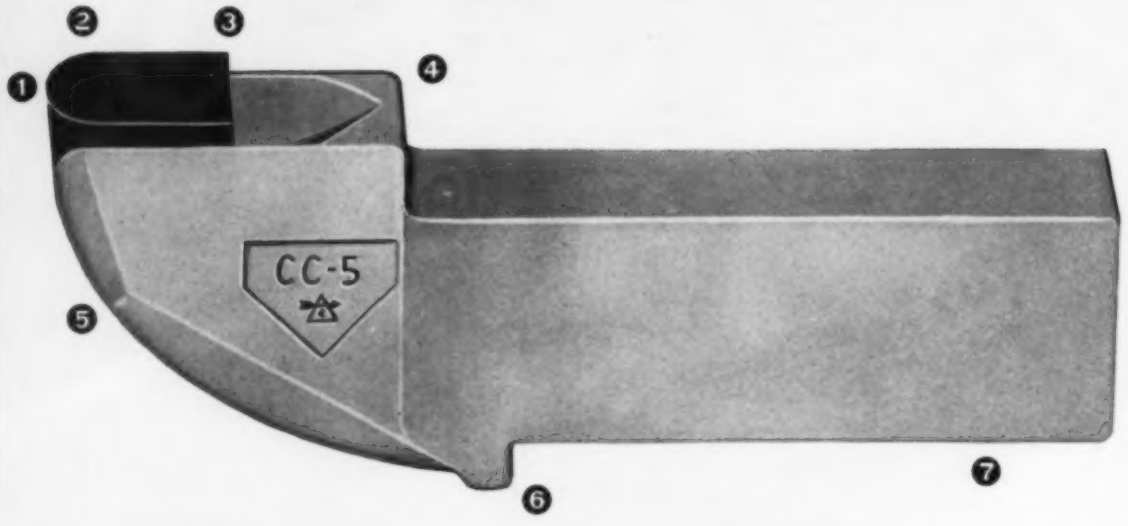
Proposed tests and procedures leading to bureau certification of fire-resistant conveyor belts have been published in the Federal Register. Persons interested were invited to send their comments to Director J. J. Forbes, Bureau of Mines, and pertinent material received by Oct. 1, 1955, was to be considered in preparing a final schedule.

Preventing underground conveyor-belt fires is becoming increasingly important, Mr. Forbes said, noting that the mileage of conveyors used for main haulage in underground bituminous-coal and lignite mines alone has more than tripled in the past ten years. About one-third of the coal mined underground now moves on conveyor belts.

Bureau reports show that conveyor belts were involved in at least 42 mine fires between 1947 and mid-1954. One of these took four lives, another took one, and two others caused severe injuries.

Most conveyor belts used in mines today are made of combustible material and are capable not only of starting but also spreading fires. While some manufacturers claim their conveyors are fire-resistant, up to now there have been no formal standards for determining the accuracy of these claims, Mr. Forbes said.

Under the proposed schedule, conveyor-belt manufacturers would submit samples of their product to the Bureau's Central Experiment Station, Pittsburgh, Pa., for testing. If the sample is approved



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2 **Side wear eliminated.** Full-width tip protects shank sides during cutting action.

3 **Stronger braze.** Exclusive V-shaped tip and recess supply maximum brazing area; permit stronger bond.

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5 **Cleaner cutting action.** No obstructions on top, maximum clearance for shank mean easier, cleaner cutting.

6 **No jamming.** 1¾" stop provides maximum hold; prevents bit from being jammed into sprockets.

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Carboloy CC-5 heavy-duty bit produces more lump coal

From tip to shank, the Carboloy® CC-5 is specially designed for undercutting and continuous mining under the most difficult cutting conditions.

The heavy-duty CC-5 reduces minus ten mesh coal production . . . yet cuts smoother and more freely. It reduces maintenance costs because it requires less bit changing, and sharpens faster.

The exclusive V-shaped tip and recess provide 40% more holding power for the carbide, eliminating premature tip breakage. The carbide in the CC-5, as in all Carboloy Mining Tools, outlasts steel by up to 50 times; increases tonnage from 20% to 30% per shift.

The CC-5 heavy-duty bit is designed for all continuous miners and cutting machines using standard ½" or ¼" bits. It is also available with a ¼" hole in the shank, for locking-pin installations.

Get immediate delivery on the CC-5, or any of the complete line of Carboloy Mining Tools, from your local Authorized Carboloy Mining Tool Distributor (he's listed on the opposite page). For price lists, specifications, or expert assistance on carbide mining-tool applications, call him today.

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the manufacturer will receive written notification that the belt has met the bureau's requirements and permission to mark it as accepted by the Bureau of Mines for listing as fire-resistant.

"The tests and procedures proposed were developed through intensive research," Mr. Forbes said. "When the schedule has been revised in the light of comments received, I feel it will be an important contribution to coal mine safety."

Coal's Future Importance Emphasized in Congress

Rep. Thomas A. Jenkins (R., Ohio), in a statement appearing in the final edition of the Congressional Record for the first session of the 84th Congress, has warned against "a tendency to overemphasize the possibilities of nuclear fission to the neglect of traditionally basic fuels." He emphasized the importance of the coal industry and recommended removal of "whatever unnecessary obstacles are burdening" it.

Explaining that electric power generation will by 1975 require at least three times more coal than is currently being consumed, Rep. Jenkins declared that this fuel will be the "fundamental source of energy for a long time." Under the circumstances, he continued, federal and state governments "owe it to the general public, as well as to mine owners and mine workers, to rectify any unfair conditions that have come about."

Recalling the report of the President's Materials Policy Commission, which estimated that in a little more than 20 yr coal consumption in the U. S. will rise to more than 800 million tons annually, Congressman Jenkins said that the industry "must be ready for the great undertaking that lies ahead." Coal has always been an "essential element" in America's progress and will "continue to be so for many generations to come," he emphasized.

Bureau to Establish Mine Lighting Standards

As a step toward reducing hazards caused by inadequate coal-mine illumination, the Bureau of Mines is preparing to approve power-circuited lighting systems as permissible for use in gassy or dusty mines, Secretary of the Interior Douglas McKay announced Sept. 8. Standards to provide a basis for such approval have been published in the Federal Register and all interested persons have been invited to submit their views to Director J. J. Forbes, Bureau of Mines.

Experimental installations of floodlights in nongassy mines in Alabama and Pennsylvania have demonstrated that fixtures, switches, cables and other accessories can be built sufficiently strong to endure the shock of blasting and the dripping of acid water. Improved accident records and greater efficiency of operation followed, Mr. Forbes said, so that both the bureau and mining companies became interested in the development of permissible (approved) lighting equipment that could be used in all coal mines.

"The bureau will begin testing lighting equipment for permissibility at the Central Experiment Station, Pittsburgh, Pa., according to our established procedure. I predict that installation of adequate underground lighting facilities will make a big contribution to coal-mine safety," Mr. Forbes stated.

Coal-to-Gas Tests Stepped Up

Experiments to convert coal to gas are being stepped up, according to J. R. Armstrong, solicitor of the Department of Interior, who spoke last month before the Mineral Law section of the American Bar Association meeting in Philadelphia. Mr. Armstrong said that mixtures of carbon monoxide and hydrogen can be converted catalytically into methane, the principal properties of natural gas. He disclosed that the Bureau of Mines and the Atomic Energy Commission were working together on tests using atomic energy as a source of heat for turning coal into gas underground.

EQUIPMENT APPROVALS

Ten approvals of permissible equipment were issued by the U. S. Bureau of Mines in August, as follows:

Joy Mfg. Co.—Types 1-CM-2HH and 1-CM-2AHH continuous miners; seven motors, four 7½-hp, one 15-hp and two 100-hp, 415 v, 50 cycles, AC; Approval 2-1074A; Aug. 4.

Long Co.—Type 626 elevating conveyor; one 10-hp motor, 230 v, DC; Approval 2-1075; Aug. 12.

Joy Mfg. Co.—Types 8SC1PF-1 and 8SC1PXF-1 cable-reel shuttle cars; four motors, 7½-hp, 500 v, DC; Approval 2-908A; Aug. 12.

Goodman Mfg. Co.—Type 460BHR loader; two motors, one 50-hp and one 8-hp, 500 v, DC; Approval 2-720A; Aug. 17.

Schroeder Brothers—Model T2SP1 pump; one 5-hp motor, 250 v, DC; Approval 2-1076; Aug. 17.

Ensign Electric & Mfg. Co.—Type Single G distribution box; 100 amp, 230 v, DC, or 220/440/550 v, AC; Approvals 2-1077 and 2-1077A; Aug. 18.

Long Co.—Model M-500 mobile conveyor; one 25-hp motor, 220/440 v, AC; Approvals 2-1078 and 2-1078A; Aug. 23.

Caterpillar Tractor Co.—Type D2 diesel tractor; for use in non-coal mines; Approval 2407; Aug. 24.

Joy Mfg. Co.—Type WK82 Model 240T air compressor; one 50-hp motor, 230 v, DC; Approval 2-1079; Aug. 25.

Joy Mfg. Co.—Type 10SC1ABPF-2; cable-reel shuttle car (modified by SBM8621); five motors, three 15-hp and two 10-hp, 500 v, DC; Approval 2-1080A; Aug. 29.

News Briefs . . . From p 118

tion they wanted to join the union. The Virginia damage suits were filed by Howard Mounts and M. E. McCoy. Both contended that the union forced them to abandon lucrative businesses in 1954 because of mob picketing, coercion and intimidation. Each asked for $300,000.

Armco Producing Soon From New Montcoal Mine

Some 90,000 tons per month are expected from the new Armco Steel coal mine, Montcoal No. 7, Montcoal, W. Va., when the operation reaches full capacity sometime in January, 1956. Thus far Armco has been pushing construction, employing only a skeleton crew of miners. In full production, the mine should employ 110 men. The seam is situated some 600 ft above a preparation plant on a bank of the Coal River. With construction in progress coal has been lowered down the huge slope on a temporary conveyor installation that will eventually be replaced by a rope-and-button conveyor.

ICC Approves Trainload Rate

The Interstate Commerce Commission approved a railroad-proposed "train-load" coal rate last month for some West Virginia and Kentucky coals being shipped to Chicago via Mt. Vernon, Ind. The rate, $1.89 a net ton, is applicable only between Mt. Vernon and Chicago. The ICC approval marks the first time the regulatory body has approved a multi-car rate without a strong showing from barge line or pipe-line competition. The rate applies only on coal being shipped from Gary and Kayford, W. Va., and Price, Ky., to either Kenova or Credo, W. Va., for transshipment by barge to Mt. Vernon, then, under the new rate, to Chicago.

P&R Buys Union Underwear Co.

Philadelphia & Reading Corp. bought the Union Underwear Co., Inc., last month after P&R shareholders had voted in August to diversify. No price was disclosed but Union Underwear's sales for 12 mo ending July, 1955, were some $28,000,000. The purchase was a step by the corporation, formerly the Philadelphia & Reading Coal & Iron Co., to reestablish itself as a profitable enterprise. Some months ago its president, Edward G. Fox, said that profits had slipped.

Utility Plant Coal Costs Drop

The country's steam-electric plants paid 30c a ton less for coal in 1954 than 1953. At least that's the result of a study by the National Coal Association, whose research men found that the national average cost of coal to steam-electric plants was $6.31 a ton in 1954, $6.01 in 1953. At the same time oil costs increased 2.9%, the NCA says, while natural gas rose 4.6%. The study covered 890 utility steam plants and accounted for 96.2% of total steam-electric plant coal consumption.

Koppers to Build Ovens For Pittsburgh Steel

Pittsburgh Steel Co. last month awarded a contract to Koppers Co., Inc., for the design and construction of a 19-oven coke battery with auxiliary equipment at Monessen, Pa. The steel company announced the contract Sept. 23.

As part of Pittsburgh Steel's cost-

COAL MEN ON THE JOB . . .

VIKING COAL CORP., Terre Haute, Ind.—Colvin Burk (left), chief engineer, and Stewart Johnson, underground superintendent, Viking mine.

"This coal **won't break up** in shipment"

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That's because it was Airdox-mined. Airdox dislodges coal from the face so gently that there are no shattercracks created to cause degradation during shipment. Users get the coal size they order; shippers get an extra quality feature that boosts sales. Best of all, this modern non-explosive mining method actually cuts production costs while yielding a higher quality product.

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Library, Pennsylvania
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Phone: Library Colonial 3-6910

Camden-on-Gauley, W. Va.
Phone:
Camden-on-Gauley 2181

Evansville, Indiana
307 Northwest Fifth St.
Phone: Evansville 2-8944

Ottumwa, Iowa
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Murray 4-6564

reduction program, the new coke-oven battery will increase the coal carbonizing capacity of the Monessen plant 25% to 2,500 net tons per day. The 19 ovens will be of the Koppers-Becker underjet type.

In addition to the ovens, the contract calls for construction of a primary cooler, a final cooler, a coke pusher and an electrostatic precipitator.

Construction of the new battery and the auxiliary equipment will be completed by June, 1956.

Construction Progressing On AEC Ohio Power Plants

The Ohio Valley Electric Corp. last month announced it had passed the half-way point in the bringing into service facilities to supply the full electric power requirements of the Atomic Energy Commission's project at Portsmouth, Ohio. The half-way mark was passed when the sixth of 11 giant steam-electric generating units being built by OVEC was completed and placed in operation early in the month. It is the third unit at Kyger Creek plant, on the Ohio River near Gallipolis, Ohio. Unit 3 at its sister station, Clifty Creek plant, also on the Ohio River at Madison, Ind., was placed in operation in July. The two stations, upon their completion early in 1956, will be the largest power plants ever built by private enterprise. Larger of the two, Clifty Creek, will have a total generating capacity of 1,290,000 kw, Kyger Creek a capacity of 1,075,000 kw.

Federal Support Again Urged For Synthetic Fines Plant

Pointing out that inexpensive electric power generated by the atom is "still confined to the realm of theory," Rep. John P. Saylor of Pennsylvania has reiterated—in a statement appearing in the Congressional Record issued last month—his earlier recommendation that the government divert some of the federal funds from its reactor program to a project aimed at setting up synthetic-fuels plants in coal areas. In calling attention to "overlooked costs" in the commercial application of atomic energy, his statement was intended to refute reports that electricity produced by nuclear fission will soon be marketable at prices below the cost involved in the use of conventional fuels. Rep. Saylor referred to the Carbide & Carbon Chemicals hydrogenation plant at Institute, W. Va., where various chemicals are being produced from raw coal, as an example of the type of plant that can produce synthetic fuels. A synthetic-fuels industry might be the only deterrent to a fuels shortage in the event of an emergency when foreign supplies are not available and energy demands suddenly rise, he pointed out

British Coal Board, Union Maps Plans Against Decline

England's National Coal Board and National Union of Mineworkers completed plans last month for a joint study of the reasons for the decline in Britain's coal production. This year's production, 149,503,000 tons, is 3,250,000 tons below last year. At the same time the coal board reported a deficit of $53,729,351 during the second quarter of this year. Nearly $19,000,000 was attributed to the loss of imported coal. The joint study was suggested by the union after it deferred a decision on a board proposal to bring 10,000 Italian and Austrian miners to ease the English labor shortage.

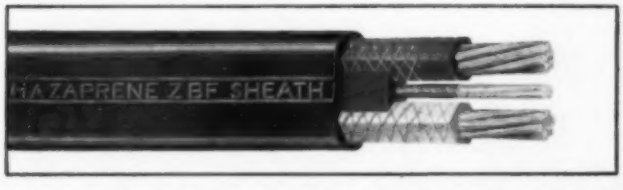
COAL MEN ON THE JOB . . .

POCAHONTAS FUEL CO., INC., Pocahontas Colliery No. 31, Amonate, Va. —C. S. Davis (left), general tipple foreman; J. B. Agnew, coal inspector; and Elmo Stanley, foreman of the fine coal plant.

tonic for a tired shuttle car

The shuttle car is just about the hardest working machine in a coal mine. It's a glutton for punishment and for cable, too. The fate it hands out to cable is cruel—a succession of run-overs and almost constant abrasion. But, tough as a shuttle car is, there is nothing more "beat" than one that's suffering from beat-up cable.

It's different, however, with Hazacord Red Saddle Hex-Tite Shuttle Car Cable on the job. Hazacord's Hex-Tite design prevents internal slipping and rotation, forms a solid locked-tight construction that makes Hazacord the match for any shuttle car. And the Red Saddle pre-formed protective wall of neoprene assures a uniform fill between conductors . . . positive protection against short-circuiting due to run-overs.

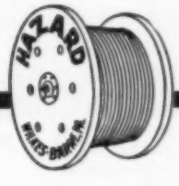


Hexagonal insulation provides six plane surfaces to lock with the Hazaprene ZBF sheath and bonded Red Saddle, preventing internal slipping and rotation. Heavy reinforcing cords, embedded in both insulation and sheath, are an additional guard against pulling and a special adhesive completes the bonded construction.

Hazacord's heat-resistant insulation, bonded to the extra-flexible conductor, permits high operating temperatures. The Hazaprene ZBF sheath is cured under pressure in a continuous metal mold to assure: *1. optimum vulcanization; 2. maximum density; 3. lasting toughness; 4. smooth, wear-resisting surface; 5. resistance to mechanical abuse; 6. controlled diameter.*

Hazaprene sheaths are flexible and unaffected by oils, acids, alkalies and mine water.

Write for Bulletin H-450, the Hazard Mining Cable Catalog, for information on the cables that are a match for any shuttle car. Hazard Insulated Wire Works, Division of The Okonite Company, Passaic, N. J.



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COAL MEN ON THE JOB . . .

VALLEY CAMP COAL CO., Valley Camp No. 8 mine, Shrewsbury, Kanawha County, W. Va.—Thurmond Martin (left), plant foreman; Thomas P. Bradford, engineer; and Floyd M. Bowen, plant operator.

TVA Receiving Plant Opens In Alabama

The Tennessee Valley Authority's new coal-handling facilities began operating last month at Tuscumbia, Ala. Some 500,000 tons a year will be handled by the installation that will feed coal to the TVA's Colbert steam plant. The authority said initial shipments of 500 tons a week would arrive from the Alabama Fuel Sales Co., Natural Bridge, Ala. The plant burns some 2,100,000 tons a year and is serviced by rail and barge.

1955 Cleaner Air Week Points Up Progress

The National Coal Association is reminding fuel producers and consumers that Cleaner Air Week for 1955 will be observed Oct. 23-29. The event is sponsored by the Air Pollution Control Association under direction of Charles N. Howison, Cincinnati, chairman of the Cleaner Air Week Committee. It is intended not only to remind industry and the general public of the need for keeping air pollution at a minimum, but also to point out the progress that has been accomplished in this field in recent years. In the 6 yr it has been observed nationally, Cleaner Air Week has aided in alerting the general public to the fact that the gasses, exhaust fumes, pollen, dust, smoke, and fly ash can be effectively reduced if air sanitation rules are carefully observed. As in past years, the Secretary of Commerce has again endorsed Cleaner Air Week.

U.S. Steel's Robena Mine Wins Pennsylvania Aid Meet

United States Steel's Robena slope mine scored 99.600 to capture first place in Southwestern Pennsylvania Safety Association's first-aid contest Aug. 20 at the Waynesburg, Pa., fair grounds. Cap-

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USE PROPER LENGTH LEG WIRES: Use leg wires long enough to initiate each blast at the point of maximum confinement, usually the bottom of the hole. Improve profits with more yardage per shot, better fragmentation, and fewer misfires. For dependable circuits, use the new ATLAS Twinplex assembly . . . extra long and strong. Tough plastic sheathing protects wire insulation in rough holes. Specially made for thrifty bottom initiation with Rockmaster® electric blasting caps.

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ORDER WISELY: Advance-order your millisecond delays so that periods needed are always on hand. Stock a magazine for your particular needs with the aid of your ATLAS Representative. He'll help you select the right explosives and the Rockmaster blasting patterns best suited to each job. Continuous production and good breakage lower costs, boost profits.

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tained by Guerino Shannon Jr., the team was awarded a cash prize, a plaque and a trophy. Second place was won by Westland mine, Pittsburgh Consolidation Coal Co., with 99.533. United States Steel's Palmer mine placed third with 99.400.

In Latrobe, Pa., the Pittsburgh Coal Co.'s Hostetter mine won first prize in the Westmoreland County Safety Association first-aid competition. Led by Steve Rushnock, the team scored 99.867 to win a cash award and safety plaque. Hutchinson mine, Westmoreland Coal Co., was second with 99.800. Seanor mine, Seanor Mining Co., was third with 99.733.

Blue Diamond Teams Sweep Kentucky Aid Meet

Three first-aid teams from the Blue Diamond Coal Co. won top honors last month in Kentucky when they captured the first three places of the 25th annual Kentucky River Mining Institute's safety-day competition. The championship was won by Blue Diamond's No. 2 mine at Tilford, Ky. Second place was won by the company's mine at Blue Diamond, Ky. Third was won by its No. 1 mine at Leatherwood, Ky. The Tilford team was awarded $150 for first place and a trophy. Second and third place prizes were $120 and $90.

NCA Executive's Reply to Oil

Tom Pickett, executive vice president of NCA, struck back last month at oil interests that had said residual fuel oil restrictions are unnecessary because the coal industry had been experiencing increased sales this year. Mr. Pickett wrote to Office of Defense Mobilization Director Arthur Flemming in answer to statements by John White, chairman of the National Oil Jobbers Council. Mr. White attacked the efforts of Dr. Flemming to encourage voluntary action by oil importing companies in accordance with the recommendations of the President's Advisory Committee on Energy Supplies and Resources Policy. Mr. White had said that the coal industry was enjoying "one of its best years domestically with bright prospects for foreign sales." Mr. Pickett replied that White's conclusions were "in error" and said that although 1955 production was ahead of 1954, this year's output is still "far short" of defense needs.

British Claim Success With Slurry Burning Stoker

The National Coal Board, Great Britain, has completed an experiment in burning low-grade fuel which may result in considerable savings in cost and release better grade coal for the market. The NCB has been using a new type of fully-automatic mechanical stoker to burn slurry rejected from washeries. Known as the Martin stoker, the new German-designed equipment has been adapted and installed at Llay Main Colliery, North Wales. It has been consuming about 650 tons of slurry a week, replacing the 450 tons of washed small coal previously used to raise steam on watertube boilers fired by chain grate stokers and hand-fired Lancashire boilers.

Savings of $2,800 a week have resulted from changing the fuel and the experiment indicates that raw slurry can be burned satisfactorily in a watertube boiler. Combustion is completely smokeless at all loads. The Llay Main plant went into operation Jan. 9, 1955. By June 1 it had steamed for about 3,000 hr, burned about 14,000 tons of slurry and carried about 40% of the regular colliery steam load. The installation cost about $364,000 including a 50,000-lb-per-hr watertube boiler and accessories, the Martin stoker, a coal- and ash-handling plant, a feed-water treatment plant and other equipment. Further installations are under consideration and one is already under construction at Bowhill colliery, Scotland.

Anthracite Makes Debut As "Semi-Precious" Stone

A NEW YORK JEWELRY DESIGNER, Le Beau, believes that the beauty of anthracite as a "semi-precious stone" has been untapped. As a result he has designed earrings and cuff links as examples of what can be done with "black diamonds." Once finished the hard coal becomes completely color fast. According to the Anthracite Information Bureau, 342 Madison Ave., New York 17, N. Y., hard coal is more than 90% pure carbon, making it a close cousin of the 100% carbon white diamond. Further information from the AIB.

And For Your Information

A £ 10 million all-electric colliery will be producing about 2,000 tons of coal daily by 1962, 4,000 by 1965. The new colliery is to be sunk this fall at Newton-Le-Willows, Great Britain.

Red China reported last month that 124 new coal mines would be built and 57 old mines restored under China's first 5-yr plan. The report came from the new China News Agency, which said

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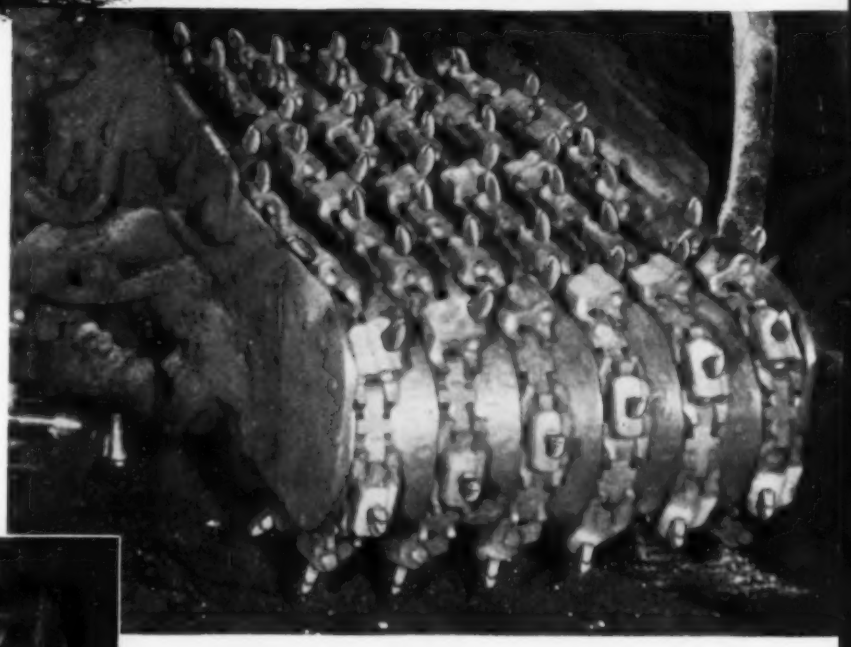

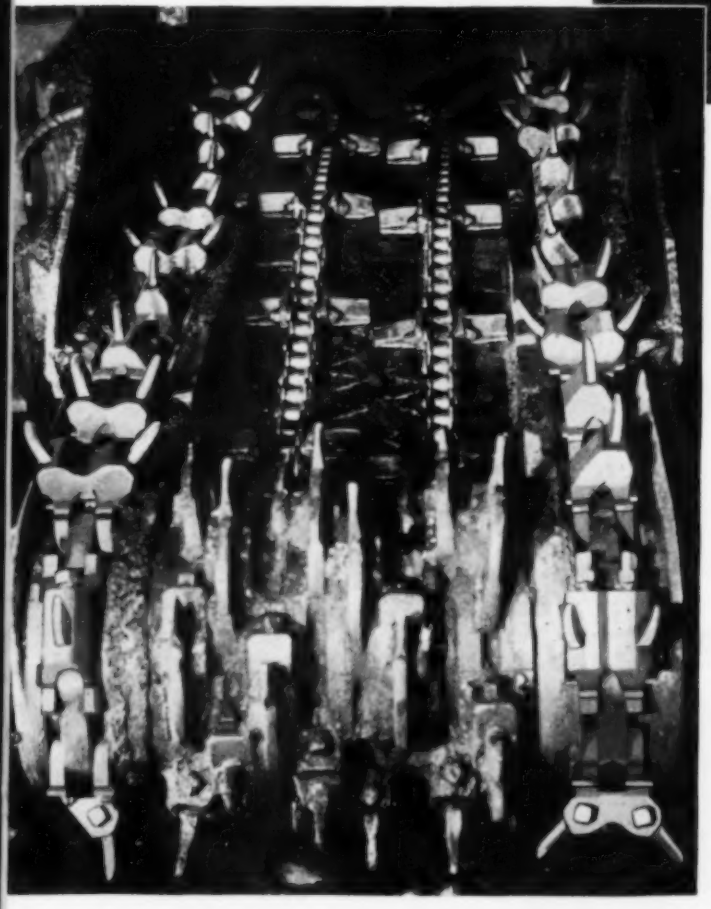

Here are illustrated just two of the many well-known CONTINUOUS MINING MACHINES on which CINCINNATI CHAINS are being used. No matter what type of CONTINUOUS MINER YOU HAVE . . . CINCINNATI HAS THE CHAINS TO GIVE YOU MAXIMUM PERFORMANCE.

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total coal output is expected to rise to 113,000 000 tons in 1957, compared to 63,530,000 in 1952. The agency reported added that a production capacity of 9,300,000 tons would be reached in the Kailan mines of north China and that 9,300,000 tons would be reached in the Fushun mines in the northeast.

Colorado-Ute Electric last month selected Cortez, Colo., as the site for a proposed 25,300-kw steam generating plant. A ton rate of $2.90 was submitted by the Montezuma Coal Mines to deliver coal to the Cortez plant door.

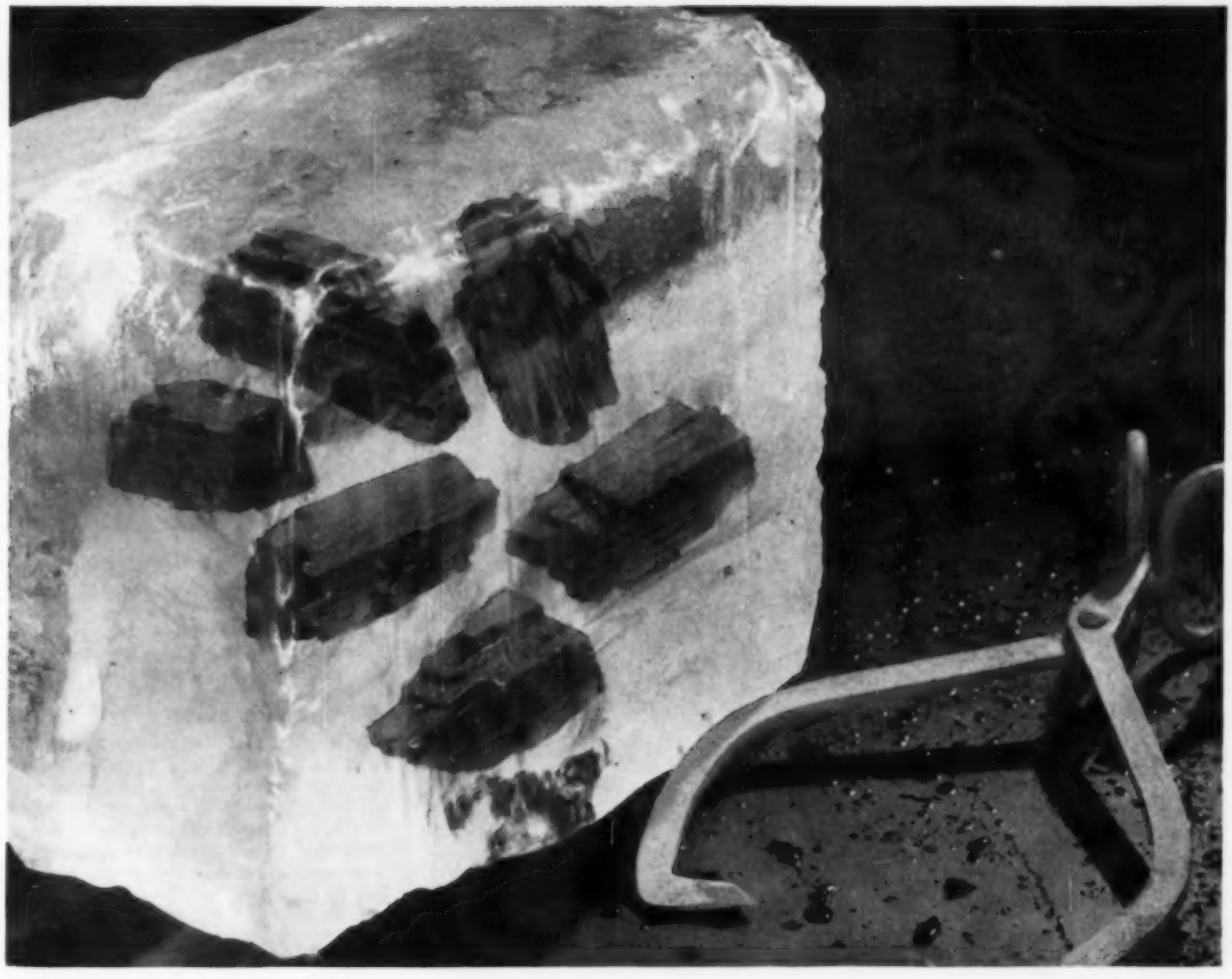
Automatic Anthracite burning equipment sales in New York state scored more than 100% during 1954, according to dealer disclosures last month at the New York State Fuel Merchants Association in Saranac Inn, N. Y. Otis Burt, president of the association, said that home use units are up 50%, commercial units 150%, thus the 100% average.

Virginia's institutions and state agencies bought 36% of their coal from Virginia mines during 1953-54, a study by a state budget division shows. Virginia's agencies bought 32,405 tons of Virginia coal and 75,966 tons from other states during the one year period.

An atomic power section will be a feature of the Chicago Exposition of Power and Mechanical Engineering at the Chicago Coliseum, Nov. 14-18. Exhibits will show atomic energy applications of special interest to mechanical engineers. The exposition is sponsored by the ASME whose Nuclear Engineering Div. will provide a program of technical papers on atomic power for the society's concurrent meeting.

COAL MEN ON THE JOB . . .

JOHNSTOWN COAL & COKE CO., Nettie, Nochilas County, W. Va.,—Leonard Wood, assistant general mine foreman, Crichton No. 4 mine; Harold Zell, mining engineer, Firth Sterling, Inc.; and Frank R. Klesyk, tool engineer, Firth Sterling.



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Accident Information

Accident Facts contains the National Safety Council's latest statistics on all types of accidents in industry, traffic, home and farm. The book provides a source of ideas for speeches, articles and meetings on safety. *96 pp. 75¢ less in quantities, National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.*

Falling Barometer Is Danger Signal

Effect of Changes of Atmospheric Pressure on Gas Emissions from Worked-Out Areas in an Illinois Coal Mine, by D. D. Dornenburg, J. A. O'Connor and E. J. Harris. This report covers a study made in an Illinois mine to determine the effect of barometric pressure on the emission of methane. Instruments used in making tests and test procedures are included. *R. I. 5147. 21 pp. 8x10½-in; paper; mimeo. Free, Bureau of Mines, Publications Distribution Section, 4800 Forbes St., Pittsburgh 13, Pa.*

Oil and Gas Facts

Petroleum and Natural Gas, a portion of Bulletin 556, Mineral Facts and Problems, contains up-to-date information on production, reserves, transportation and uses, plus interesting historical descriptions. *40¢, Superintendent of Documents, Government Printing Office, Washington 25, D. C.*

Other Books and Booklets

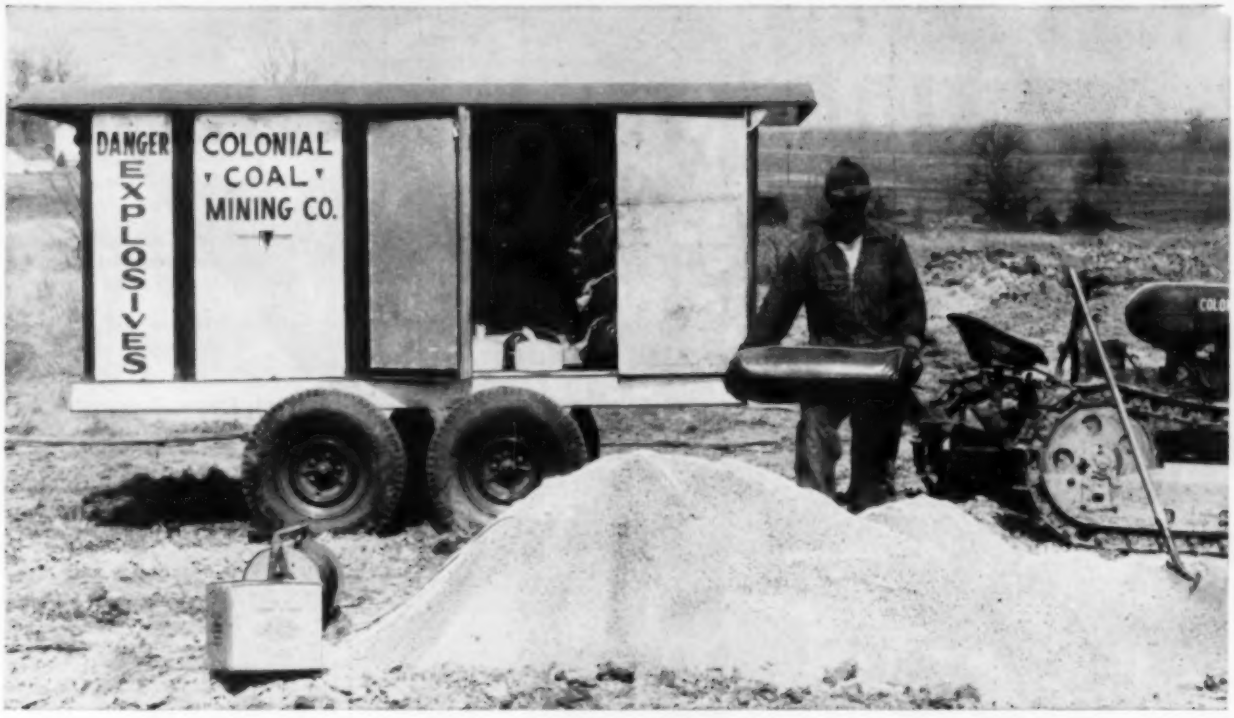
Structure of the Shoal Creek Limestone and Herrin (No. 6) Coal in Wayne County, Illinois, by Ernest P. Du Bois and Raymond Siever. R. I. 12. 7 pp plus maps. 8¼x9⅞-in; paper. No price quoted. State Geological Survey, Urbana, Ill.

Geology of the Deep River Coal Field, North Carolina, by John A. Reinemund. Geological Survey Professional Paper 246. 159 pp plus illustrations. 9⅛x11½-in; paper. $4.25. Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.

Strippable Lignite Deposits, Slope and Bowman Counties, North Dakota, by Roy C. Kepferle and William C. Culbertson. Geological Survey Bulletin 1015-E. $1. Superintendent of Documents, Washington 25, D. C.

Geology and Coal Deposits, Jarvis Creek Coal Field, Alaska, by Clyde Wahrhaftig and C. A. Hickcox. GSB 989-G. 13 pp. plus maps. 6x9 in; paper 65¢, Superintendent of Documents, Washington 25, D. C.

Geology and Coal Resources of the Henryetta Mining District, Okmulgee County, Oklahoma, by R. J. Dunham and J. V. A. Trumbull. GSB 1015-F. 42 pp. 6x9-in; paper. $1. Superintendent of Documents, Washington 25, D. C.



How New Akremite Method Helps Us Cut Explosive Costs 40% to 60%

. . . main ingredient we use in new "make-it-yourself" explosive is Spencer Commercial Grade Ammonium Nitrate

By JAMES E. MINER, *President, Colonial Coal Mining Company*

THE "Do it yourself" fad is not restricted to the basement workshop as far as the Colonial Mining Co. is concerned. Strip miners of coal now are making their own explosive for overburden shooting.

Hugh B. Lee, president, and Robert Akre, superintendent of drilling and shooting, Maumee Collieries Co., Terre Haute, Ind., have developed a new type explosive for strip and open pit mining. Called the Akremite Blasting Process, Colonial Coal Mining Co. is now using the method under license from Maumee.

Drilling and shooting conditions will vary with each mine so that no rule of thumb can be used to show shooting costs. However, Akremite is saving us 40% to 60% compared with the cheapest commercial explosive and is giving at least equivalent results when shot on a pound for pound basis.

For a specific example of the savings, take our experience at Colonial Mine. We purchased a Bucyrus-Erie 50-R drill and began using Akremite about a year ago. For an 11-month period after using this combination we enjoyed an 18-cent per ton reduction in drilling and shooting costs over a like period before its use, while our stripping ratio was reduced by one yard, from 7½ to 1 to 6½ to 1. Depreciation of the drill is included in the calculations of cost.

The main ingredient in the Akremite Method is a commercial grade ammonium nitrate. We use Spencer Commercial Grade Ammonium Nitrate. A great deal of practical research has been done by the Spencer Chemical Company in cooperation with Maumee Collieries to produce this raw material with the proper moisture content, density, screen analysis, caking quality and ability to take the correct carbonaceous coating.

(NOTE: Spencer Chemical Company will be happy to provide you with further information about the Akremite Method as discussed by Mr. Miner.)

The following publications by the U. S. Bureau of Mines may be obtained free upon request to Publications Distribution Sec., 4800 Forbes St., Pittsburgh 13, Pa. All are 8x10½-in; paper; mimeo.

Synthesis of Methane, by Murray Greyson, J. J. Demeter, M. D. Schlesinger, G. F. Johnson, James Jonakin and J. W. Myers. R. I. 5137. 50 pp.

Low-Temperature Carbonization of Coal and Lignite for Industrial Uses, by V. F. Parry. R. I. 5123. 27 pp.

Frost-Control Practices and the Prospective Use of Anthracite, by J. D. Clendenin. I. C. 7714. 45 pp.

Estimate of Known Recoverable Reserves and the Preparation and Carbonizing Properties of Coking Coal in Overton County, Tenn., by Lloyd Williams, R. F. Abernethy, B. W. Gandrud, D. A. Reynolds and D. E. Wolfson. R. I. 5131. 27 pp.

Estimate of Known Recoverable Reserves and the Preparation and Carbonizing Properties of Coking Coal in Sequatchie County, Tenn., by Lloyd Williams, R. E. Hershey, R. F. Abernethy, B. W. Gandrud and D. A. Reynolds. R. I. 5136. 28 pp.

Washability Characteristics of Coals From the Black Mesa Field, Ariz., by W. L. Crentz. R. I. 5116. 20 pp.

Washability Study of the Pratt Bed at the Davidson Mine, Graysville, Ala., by B. W. Gandrud, H. L. Riley and Paul Sutton. R. I. 5128. 21 pp.

Preparation Characteristics of Coal From Letcher County, Ky., by J. W. Miller, T. R. Jolley and M. Sokaski. R. I. 5135. 43 pp.

Preparation Characteristics of Coal From Harlan County, Ky, by J. W. Miller, T. R. Jolley and M. Sokaski. R. I. 5140, 44 pp.

Estimate of Known Recoverable Reserves of Coking Coal in Grundy County, Tenn., by Robert E. Hershey, Lloyd Williams and B. W. Gandrud. R. I. 5148. 16 pp.

Estimate of Known Recoverable Reserves of Coking Coal in Greene County, Pa., by J. J. Wallace, J. J. Dowd, J. M. Provost, R. F. Abernethy and D. A. Reynolds. R. I. 5143. 22 pp.

Permissible Mine Equipment Approved During the Calendar Years 1953-1954, by R. A. Kearns and H. B. Brunot. I. C. 7722.

The following publications may be obtained free from the Geological Survey, Washington 25, D. C. Both are 8x10½-in; paper.

Coal Resources of Oregon, by Ralph S Mason and Margaret I. Erwin. Circ. 362. 7 pp.

Coal Reserves of the Pittsburgh No. 8 Bed in Belmont County, Ohio, by Henry L. Berryhill Jr. Circ. 363. 11 pp.

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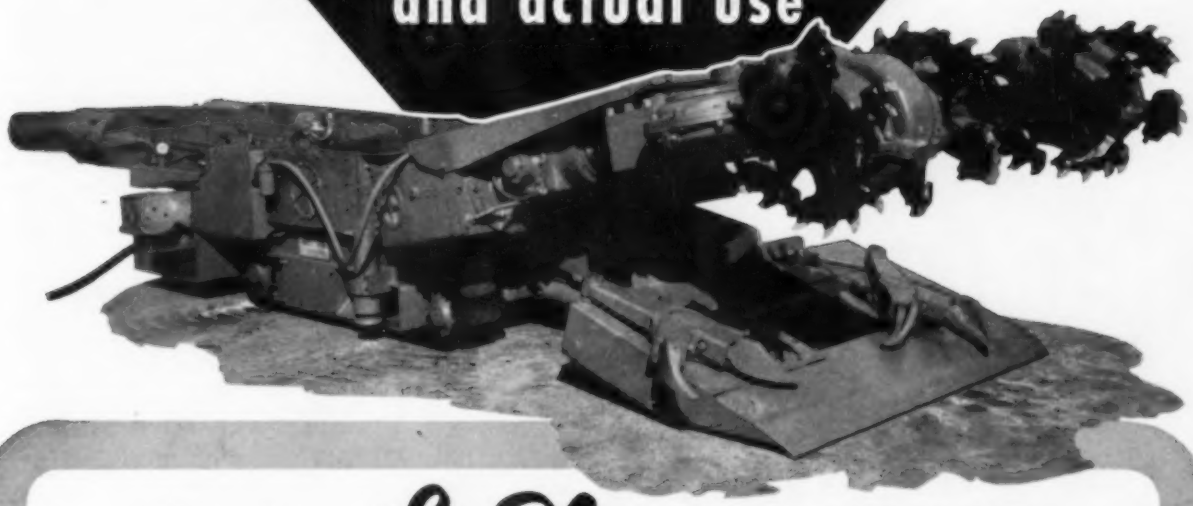

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3. Cuts its way steadily forward into the face without swinging the cutter head.
4. Has a gathering head that performs maximum cleanup — no auxiliary loading equipment necessary.
5. Produces coarse cuttings from diamond-like projections—fines are held to a low minimum.
6. Requires no additional or elaborate power facilities.
7. Combines the best features of modern loading machine designs with the unique principle of "pattern cutting".
8. Is produced by an organization with an enviable record of outstanding achievement in the field of mining equipment design and production.

Write today for literature:

Lee-Norse Company

Specialists in Coal Mining Equipment

CHARLEROI, PA.

Among the Manufacturers

D-O Appoints Stampley

Richmond M. Stampley has been appointed Western Filtration Div. manager of Dorr-Oliver Inc., with headquarters in Oakland, Calif. He will head marketing of all company filtration equipment in the 11 western states. He joined the Western Filtration Div. after 4 yr with Union Oil Co.

AC Promotes Ross, Babb

Hugh L. Ross and Charles L. Babb have been appointed assistant manager and chief engineer, respectively, of Allis-Chalmers centrifugal pump department. Mr. Ross has been chief engineer of the department since 1945. Previously he had been engineer-in-charge of pump design for 5 yr. Mr. Babb, who had been engineer-in-charge of centrifugal pump design, joined the company in 1924. Allis-Chalmers also has assigned Wayne C. Dannenbrink, Frank J. Dever and Julian B. Lewis to the processing machinery department as application engineers.

Schroeder Brothers Appointed

Schroeder Brothers, Pittsburgh 1, Pa., has been appointed western Pennsylvania and West Virginia representatives for Rivett, Lathe & Grinder, Inc. of Boston, Mass., manufacturers of air and hydraulic valves, cylinders and hydraulic power units. The Pittsburgh company has also been appointed representative in the same areas for Gerotor May Corp., Baltimore, Md., hydraulic-pump, motor and transmission manufacturers.

H&P Appoints Sales Firm

Heyl & Patterson, Inc., Pittsburgh, Pa. has appointed George M. Meriwether, Industrial Equipment, Birmingham, Ala., its sales representative for special materials-handling equipment in Alabama, Mississippi, Georgia, Tennessee, Florida and southeastern Louisiana. The Meriwether firm, will handle H. & P. coal and ore bridges, railroad car dumpers, boat and barge loaders and unloaders, conveyor systems, and materials-handling equipment used by the mining, pulp and paper, railroad, shipping, steel and utility industries.

NMS Femco Representative

National Mine Service Co. has been appointed sales and service representative for Femco communication systems for mines. The company will distribute audio and carrier-current systems in the mining industry. Parts will be stocked at NMS

Continued on p. 150

Carlon Plastic Pipe

PROVIDES LOW-COST DISPOSAL OF CORROSIVE MINE WATER

CARLON "EF"

CARLON "L"

★ ***Outlasts metal a hundred to one (or better).***

★ ***Costs only a fraction as much as metal.***

★ ***Can be installed for half the cost of metal.***

THE FIRST Carlon* Plastic Pipe was installed in coal mines nearly ten years ago. It was used for the disposal of corrosive mine waters. And every foot of pipe sold for this service is still as good as ever.

The savings to coal operators who have used Carlon Plastic Pipe have been tremendous. The least that could be said is that each installation has paid for itself several times a year.

and there are more advantages

Carlon pipe is only an eighth as heavy as metal. It can be handled by smaller crews and without special rigging equipment. It can be easily taken up and moved to new locations. It comes in long coils so that fewer joints are needed. One man can couple thousands of feet in a day.

Take advantage of Carlon's superior quality and foremost experience in plastic pipe. Contact your nearby Carlon jobber immediately. Or write Carlon Products Corporation, 10225 Meech Avenue, Cleveland 5, Ohio.

*®

CARLON BUY THE PIPE CARLON CP WITH THE STRIPE **PRODUCTS CORPORATION**

10225 MEECH AVE., CLEVELAND 5, OHIO

WORLD'S LARGEST MANUFACTURER OF PLASTIC PIPE

Plants at Corsicana, Texas; Cleveland, Auburn Corners and Upper Sandusky, Ohio; Asheville, N. C.; Denver Colo.; Klamath Falls, Oregon, and Acton, Ontario, Canada. Research Center in Mantua, Ohio.

Premium Pocahontas Coal prepared with R&S Airflow Equipment

The modern preparation plant of the American Coal Co. of Allegany County is now producing premium stoker size coal from its Pocahontas No. 3 seam at the Deerfield mine in Wyoming County, West Virginia.

This new plant, engineered and designed by Roberts and Schaefer, employs two units of R & S Airflow equipment for cleaning 3/8" x 1/8" stoker coal and is delivering the exact results required by the owners.

In every R & S Airflow installation—and there are hundreds of units in service both in this country and abroad—Airflow equipment has proved its economy and value. It makes a good coal a better coal and poorer grades more acceptable and saleable.

Do you know what Airflow Equipment can do for you?

It will fit readily into your new preparation plans or into your present operation and will provide:

Consistent, efficient cleaning of a wide range of sizes—up to 1 5/8" and larger; down to 48 mesh.

Low-cost, trouble-free operation and far less maintenance even when capacities are big and sizing is not precise.

Separation of dust for recombining with clean coal when desired.

And note, too:

Air-washed coal flows freely, will not freeze, sheds rain in transit, is more amenable to oil treatment.

• *Phone, wire or write today for Bulletin No. 175 giving complete information including typical layouts for various types and sizes of coal; or contact our nearest office for consultation without obligating yourself in any way.*

ROBERTS and SCHAEFER COMPANY

Subsidiary of Thompson-Starrett Company, Inc.

ENGINEERS AND CONTRACTORS

130 North Wells Street, Chicago 6, Illinois

New York 19, N. Y.—254 West 54th Street
Pittsburgh 22, Pa.—1315 Oliver Building
Huntington 9, W. Va.—P.O. Box 570
Hibbing, Minn.—P.O. Box 675

"KING-SIZE" DRAGLINE for BIG JOBS

MARION 7800 WALKING DRAGLINE

35 cubic yards

"How big a bite" is only one part of the question posed by modern excavating problems.

Other questions equally important are "How far can this load be moved" and "How high can it be raised?"

The MARION 7800 Walking Dragline has impressive answers.

Imagine this Super Dragline with a 220-foot boom located along the river bank at the TOP of Niagara Falls. It could lower its 35 cubic yard bucket to the bottom of the falls, pick up a load the size of a one-stall garage and equal in weight to a rail car of coal — and deposit it on top of a building nine floors higher than the ground on which the base was resting.

The know-how, the skills and the ingenuity that make this big machine impressive are responsible for the unusual acceptance MARION machines enjoy everywhere, in sizes from ½ to 60 cu. yds.

MARION POWER SHOVEL CO.

Marion, Ohio, U.S.A.

from ½ cu. yd. to 60 cu. yds.

OFFICES AND WAREHOUSES IN PRINCIPAL CITIES

warehouses and its service organization will install and service Femco Systems.

Westinghouse Board Elects

Gwilym A. Price, president of Westinghouse Electric Corp. since 1946, was elected chairman and reelected president at a board of director's meeting in New York Aug. 24. The Chairmanship had not been occupied since 1951. The directors also elected Mark W. Cresap Jr. to serve as executive vice-president and deputy chief executive officer, Latham E. Osborne to vice-chairman of the board and John K. Hodnette, formerly vice-president of the apparatus products divisions, to vice-president-general manager. The job left vacant by Mr. Hodnette's promotion, directing manufacture and distribution of basic electrical equipment, was filled by A. C. Monteith, vice-president in charge of engineering and research. Dr. John A. Hutcheson succeeds Mr. Monteith.

Hewitt-Robins Promotes Four

Hewitt-Robins Inc. has made four personnel changes in its Engineer's Division. Martin VanderLaan, assistant to the operations manager, to assistant manager of operations; Wesley H. Raff, contract engineer, to consulting engineer; Douglas H. Martini, chief project engineer, to manager of engineering sales; and Jack Van Kleunen, project engineer, to chief project engineer.

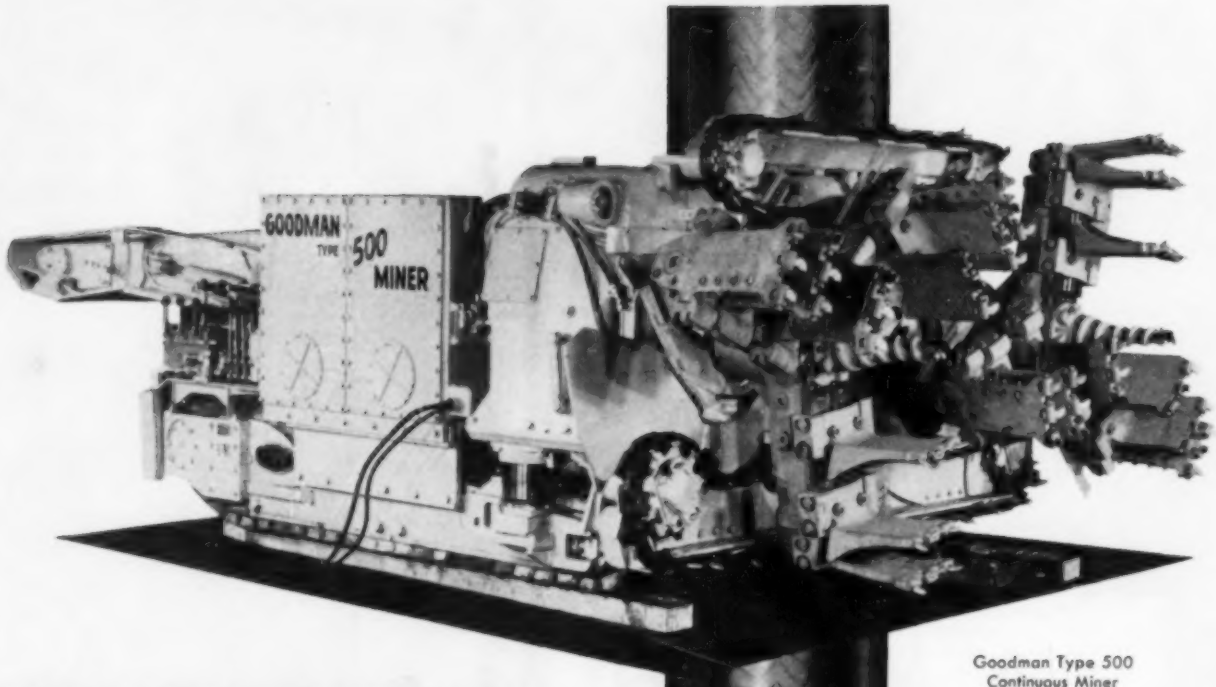
I-H Transfers 3, Ups 1

Three sales executives were transferred and one was promoted last month following the retirement of C. A. Samuelson, St. Louis district manager of International Harvester's truck division. Barr Crawford, Pittsburgh district manager, succeeded Mr. Samuelson at St. Louis; H. A. Herman, district manager in Fort Wayne succeeded Mr. Crawford at Pittsburgh; and M. J. Gowen, Richmond, Va., district manager succeeded Mr. Herman in Fort Wayne. R. W. Maxwell, assistant district manager at Richmond succeeded Mr. Gowen. Mr. Samuelson retired from service after 43 yr. He joined the company in Minneapolis and became district manager in 1944.

P&H Sales Exec. Named

J. F. Catalane has been made general sales manager of the new P&H Construction and Mining Div. of the Harnischfeger Corp., it was disclosed last month. With his new duties, Mr. Catalane becomes a member of the company's executive committee. He continues as sales manager of the Power Crane and Shovel Div. Robert P. Jones was appointed assistant general sales manager of the new division and Raymond A. Ehn was named assistant sales manager of the Power Crane and Shovel Div. The new division was formed because of increased sales. Its products are power cranes and shovels, electric shovels, stabilizers and Sierra loaders. Mr. Catalane has worked for Harnischfeger since 1945. Mr. Jones has been an assistant sales manager since 1953. He joined the company in 1943. Mr. Ehn

Continued on p 134



Goodman Type 500
Continuous Miner

ROCKBESTOS AVC®

HELPS KEEP TONNAGE UP ...MAINTENANCE DOWN

The Goodman Type 500 Miner is a continuous mining machine that cuts and loads up to 7 tons per minute from solid, unprepared seam.

With schedules geared to this kind of performance, you can't afford internal wiring breakdown. That is why Goodman Manufacturing Company uses Rockbestos A.V.C. in motor leads, headlight wiring, for rheostats, for all the panels in the contactor case. It is used exclusively wherever resistance to heat is a prime requisite.

You, too, can build in dependable wire performance in your loaders, shuttle cars, cutting and drilling machines, locomotives by rewiring with Rockbestos A.V.C. — the mining cable with the permanent insulation.

High temperatures won't dry out, or crack Rockbestos A.V.C. Exposed to oil and grease, it won't bloom or rot — And it fits bushings right.

ROCKBESTOS PRODUCTS CORPORATION
NEW HAVEN 4, CONNECTICUT

NEW YORK • CLEVELAND • DETROIT • CHICAGO • PITTSBURGH • ST. LOUIS
NEW ORLEANS • LOS ANGELES • OAKLAND, CALIFORNIA

ORDER FROM THESE JOBBERS — SPECIFY "ROCKBESTOS A.V.C."

BECKLEY, W. VA.
National Mine Service Co.
BIRMINGHAM, ALA.
Moore-Handley Hardware Co.
BLUEFIELD, W. VA.
Superior-Sterling Co.
CHARLESTON, W. VA.
Charleston Electric Supply Co.
CLARKSBURG, W. VA.
Westinghouse Electric Supply Co.
COWEN, W. VA.
Pennsylvania & W. Virginia Supply Corp.
ELM GROVE, W. VA.
Pennsylvania & W. Virginia Supply Corp
EVANSVILLE, IND.
Evansville Electric & Manufacturing Co
FAIRMONT, W. VA.
Fairmont Supply Co.
GREENSBURG, PA.
Westmoreland Hardware Co.
HARLAN, KY.
Kentucky Mine & Supply Co., Inc.
HUNTINGTON, W. VA.
Banks-Miller Supply Co.
INDIANA, PA.
National Mine Service Co.
JENKINS, KY.
National Mine Service Co.
LOGAN, W. VA.
National Mine Service Co.
LOTHAIR, KY.
Mine Service Co.
McCLURE, VA.
Erwin Supply & Hardware Co., Inc.
MIDDLESBORO, KY.
Rogan & Rogan Co.
MORGANTOWN, W. VA.
Pennsylvania & W. Virginia Supply Corp.
PITTSBURGH, PA.
Westinghouse Electric Supply Co.
SCRANTON, PA.
Pennsylvania Electric Engineering Co.
WHEELING, W. VA.
Westinghouse Electric Supply Co.
WASHINGTON, PA.
Fairmont Supply Co.
WILLIAMSON, W. VA.
Williamson Supply Co.

2¼-yd. MICHIGAN 175A carrying over 2 tons of coal in its bucket . . .

This big POWERHOUSE handles bigger jobs cheaper!

Check the specs of the MICHIGAN* 175A:

BUCKET CAPACITY..... 2¼ yds.
WEIGHT..... 24,100 lbs.
LIFTING CAPACITY..... 15,000 lbs.
SPEED..Up to 27 mph, Forward and Reverse
HORSEPOWER..... .133 Diesel, 126 Gas, 165 Supercharged

Don't look for "comparative" data on the MICHIGAN 175A—there is *no machine comparable*. This big bruiser is nearly 50% bigger than the next closest machine on the market. From flywheel to bucket, the 175A is built to do bigger, heavier jobs—jobs that no other rubber-tired machine can handle.

Better traction and flotation With the MICHIGAN's exclusive power train—300% torque multiplication, power shift transmission (no engine clutch) and planetary wheel axles—you get a shockless flow of power right down to the ground. There's no surge, no wind-up in the axle shaft, no wild wheel-spin. The operator has feather-touch control over his wheels; in weak soil conditions or mud, he can ease off or step up the power to keep from digging in. With this kind of smooth power transmission, you get the full advantage of the MICHIGAN's extra weight and power—you dig material *out*, you don't dig the machine *in*.

Hydraulic power does the work In spite of its size and power, the MICHIGAN 175A is easier to operate than most machines one-third its size. Hydraulic power does all the real work: power steering, 4-wheel power brakes, power-shifting with two simple levers on the steering column, no clutch pedal.

See it in action! We'll prove that the MICHIGAN is in a class by itself in the Tractor Shovel field: your local MICHIGAN distributor will arrange a demonstration—on your own job, if you wish. Or write for 12-page Tractor Shovel booklet containing explanation and cutaway drawings of the MICHIGAN power train. Any MICHIGAN is available on a low-cost Lease Plan—ask for brochure which explains how you can use it.

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY
Construction Machinery Division
482 Second Street
Benton Harbor 30, Michigan
Phone WA 6-6184

*A Trademark of Clark Equipment Company

has worked for the company since 1940.

Thew Shovel Elects

M. B. Garber and E. C. Brekelbaum have been elected vice presidents of Thew Shovel Co., Lorain, Ohio. C. B. Smythe, president, also was elected treasurer to replace the late H. L. Reynolds. Mr. Garber has been with Thew for 28 yr as assistant and general sales manager, export manager and director of sales. Mr. Brekelbaum joined Thew in 1952 as director of methods after 17 yr with the Harnischfeger Corp.

Toledo Names Sales Head

Richard T. Crumley has been named sales manager of Toledo Porcelain Enamel Products Co., Toledo, Ohio, according to Sylvan F. Chappuis, president. Mr. Crumley was formerly with Toledo Mirror & Glass and the Underwood Corp.

Texas Co. Research Expands

An expansion of specialized services to industry was announced last month by The Texas Co., which planned to open a technical service headquarters in Pittsburgh, Pa., Sept. 1, under the direction of J. C. Van Gundy. Frederick H. Holmes, vice-president and head of the company's research & technical department, said the new office would provide a service center for iron, steel, aluminum and other industries. The company has maintained technical services to industry since 1922 when an office was opened in Houston, Tex.

AC Expanding in Iowa

A $1,800,000 expansion program for the shops and offices of the Cedar Rapids (Iowa) works of the Allis-Chalmers Mfg. Co. was disclosed in August by B. S. Oberlink, vice-president and general manager, Construction Machinery Div., tractor group. The company's motor scrapers and motor wagons are made at Cedar Rapids. Mr. Oberlink said that productive capacity would be increased 50% and estimated that several hundred persons would be added to the present work force. The program, he said, would get under way immediately and is scheduled for completion in early 1956.

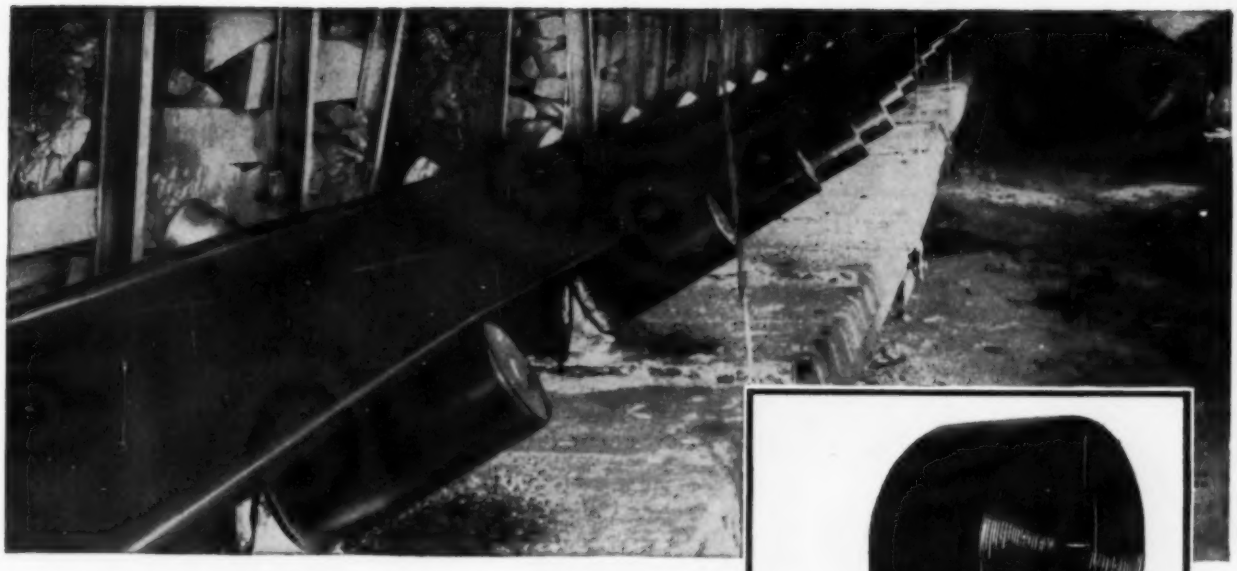
Heads Metals Sales

David T. Marvel, a vice-president of Olin Mathieson Chemical Corp., has been appointed vice-president in charge of sales of the Metals Div. Operations of the division will be expanded by establishing separate sales organizations for brass and aluminum roll bond. E. W. Sherman, formerly division sales manager, has been appointed sales manager for all brass products. H. F. Devens, formerly assistant to the general manager, has been named sales manager for roll bond products.

And For Your Information . . .

Cummins Diesel of Northern Ohio, Inc., has been appointed northeastern Ohio distributor for the Cummins Engine Co., Inc., Columbus, Ind. C. F. Irons is president of the distributor, and K. Babb

Continued on p 158



Inset shows roll of SCANDURA. Photo at left shows Face Conveyor in coal mine.

SCANDURA

the original P. V. C. fireproof

MINE Conveyor BELTING

One of the great hazards of mining — fire caused by a belt stalled over a still-rotating driving drum — is eliminated by new SCANDURA BELTING . . . . the original P. V. C. Conveyor belt which was developed in the United Kingdom and now manufactured by us in our Charlotte, N. C. plant.

Other unique SCANDURA features:

- *Its resistance to abrasion is superior.*
- *Fastener holding qualities are unusually good.*
- *The coating will not separate from the belt and will not rip or "dog-ear".*
- *The Solid Woven construction greatly reduces the possibility of mechanical damage.*
- *Stretch is not excessive.*
- *Works in temperatures ranging from 10° below to 212° above.*
- *IT IS NON-INFLAMMABLE—the ROT-PROOF Treatment protects body of the belt from mildew.*

SCANDURA has been tested and used with gratifying results in Britain since 1946 and is now being installed in American Coal Mines. For safety and economy, *it's in a class by itself.*

Exclusive Distributors *For the Mining Industry East of the Mississippi*

NATIONAL MINE SERVICE COMPANY

Suite 564, Alcoa Building, Pittsburgh 19, Pa.

SCANDINAVIA BELTING COMPANY

744 Broad Street (P. O. Box 464), Newark 1, New Jersey

PLANT: Charlotte 1, N. C. BRANCH: Cleveland 14, Ohio

If you are MOVING...

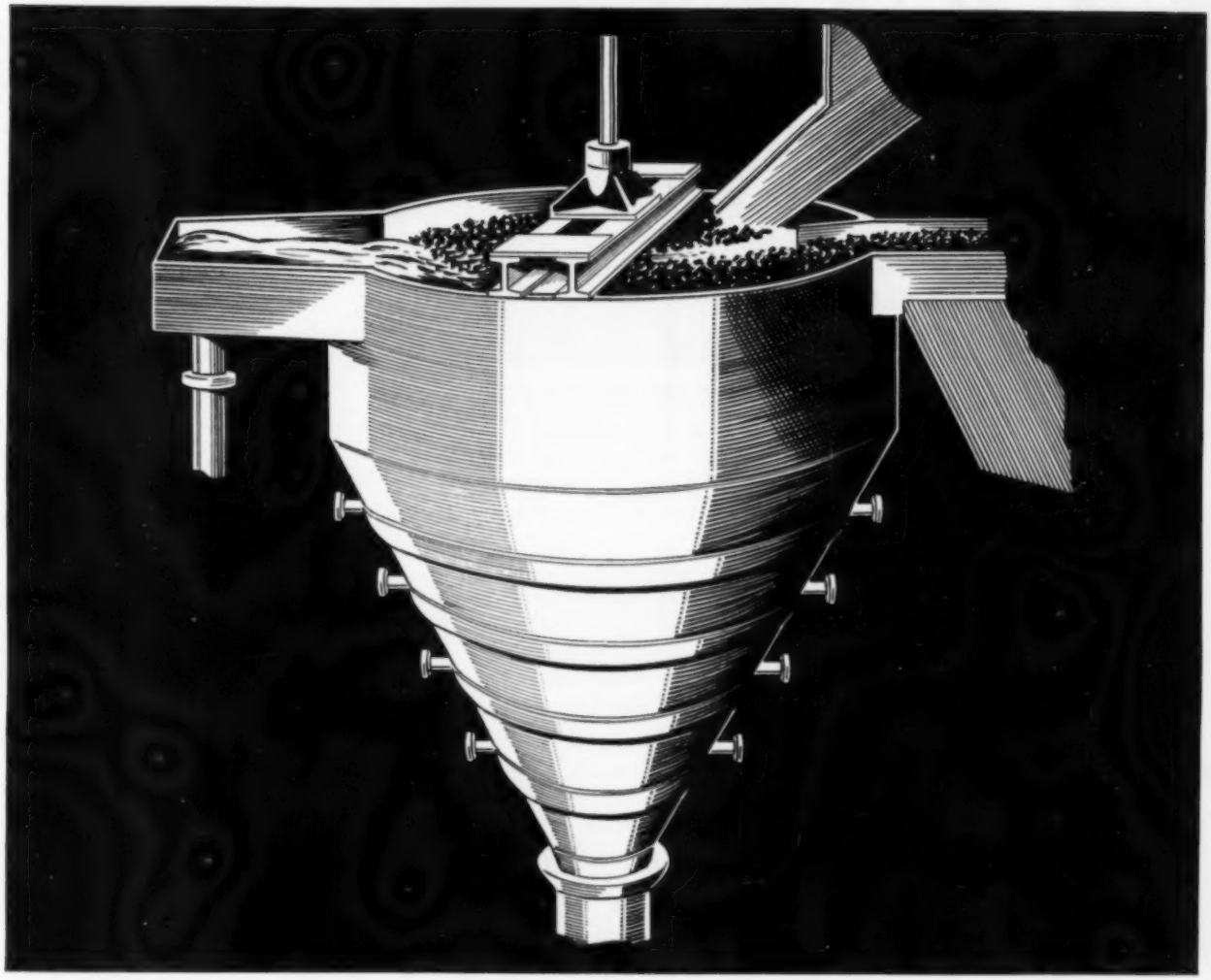
Don't forget to notify us at least one month in advance to insure uninterrupted service to your subscription to COAL AGE.

Please send your change of address together with your old address to:

DIRECTOR of CIRCULATION
COAL AGE, 330 West 42nd Street
New York 36, N. Y.

DON'T FORGET TO NOTIFY YOUR POSTMASTER, TOO!

The Chance Process—Heart of the Coal Preparation Plant



You can recover and market more than 99% of salable coal —produce a middling product—at minimum cost per ton

Whether you must clean 40 tph or 600 tph, there is Chance Process coal cleaning equipment made to give you maximum efficiency at minimum cost.

A Chance Process unit insures close to 100% recovery of salable coal and you enjoy constant efficiency, because the specific gravity of the fluid mass, composed of low-cost silica sand and water, does not change with fluctuating feed rates or varying qualities of coal.

A Chance Process unit handles coal at gravities from 1.35 to 1.65, sizes from ⅛ in. to 10 in. And a change from one washing gravity to another requires only 5 minutes' time on the part of one man—a big saving.

A Chance Process unit also yields three instead of two products. There is now a middlings take-off, adjustable from 1.30 to 1.90 gravity, that enables you to recover and market a greater part of your total tonnage. And this same take-off can be fitted to the older 2-product Chance cones.

A Chance Process unit is the economical, dependable and lasting solution to your coal cleaning problems, whatever they may be. Why not invite our engineers to study and discuss your requirements.

UNITED ENGINEERS

& Constructors Inc

U.E.&C. (Canada) Ltd.

New York 17 • PHILADELPHIA 5 • Chicago 2

COAL MEN ON THE JOB . . .

POCAHONTAS FUEL CO., INC., Bishop mine, Bishop, Va.—W. H. Bowen (left) safety engineer for the company; Riley Yates, general mine foreman; Grover Asbury, assistant superintendent; and Charles T. Stephenson, superintendent.

is general service manager. Mr. Irons said that although headquarters is in Cleveland, branches would be maintained in New Philadelphia and Akron, Ohio. He added that a service branch would be opened at Youngstown, Ohio.

Hamilton F. Biggar Jr. has been appointed manager of new product development for the Reliance Electric & Engineering Co., Cleveland, Ohio. He will combine atomic-power motor development, an activity he has been managing, with the research and technical services of the engineering department. Robert R. Hayes has been appointed supervisor of the atomic-power department. In sales, Donald C. Obermeyer has been appointed sales engineer in the company's Minneapolis branch.

Fast dozing and reverse speeds put OC-18 money ahead on strip operations

The high performance diesel engine in the Oliver OC-18 crawler has an exceptional torque span that steps up lugging as the tractor slows under load. In first gear, the OC-18 delivers 31,000 drawbar pounds' pull at 1½ miles per hour!

With power like this to back you, those long, heavy dozing runs go fast. And with a high reverse gear of 3½ miles per hour, the OC-18 clips even more time from your dozing cycle. You'll be able to move more yards in less time—pile up bigger profits on every job.

This husky crawler packs a big 133 drawbar horsepower. But powerful as it is, it operates with the ease of an automobile. Finger-tip air steering, clustered controls, center-positioned gear shift and comfortable seat are features that cut operator fatigue, increase performance and productivity.

For the real test, try this tractor yourself. See why you can do a bigger, better job at less cost with the Oliver OC-18. Call or visit your Oliver Industrial Distributor for a demonstration.

THE OLIVER CORPORATION
400 West Madison Street, Chicago 6, Illinois

OLIVER

A complete line of industrial, wheel and crawler tractors

PROFESSIONAL SERVICES

NEWELL G. ALFORD
Consulting Mining Engineer
Coal Property Prospecting
Development, Operation and
Valuation
Oliver Building — Pittsburgh 22, Pa.

ALLEN & GARCIA COMPANY
42 Years' Service to the
Coal and Salt Industries and Consultants
Construction Engineers and Managers
Authoritative Reports and Appraisals
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"Founded 1900"
Consulting Engineers
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Mine and Preparation Plant Designs
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Mining Engineers
COAL OPERATION CONSULTANTS
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J. H. FLETCHER
30 Years
Continuous Consulting Service
to Coal Mines
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Now,
more than ever before,
the coal industry should take advantage of the opportunity to use the broad experience and knowledge of the consultant and profit by such use.

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Maintenance—Inspection—Testing
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VENTILATION
R. D. #3, Irwin, Pa.

J. B. MORROW
Coal Consultant
Oliver Building — Pittsburgh, Pa.

DAVIS READ
Consulting Engineer
Layout — Operation
Modern Production Methods
Plant Design — Preparation
120 S. La Salle St. — Chicago 3, Ill.

ROBINSON & ROBINSON
Consulting Engineers
Mine Operation — Preparation
Coal Property Valuation
Industrial Engineering
Union Bldg. — Charleston, W. Va.

TEMPLETON-MATTHEWS CORPORATION
Designing Engineers—Consultants Builders
MODERN COAL PREPARATION PLANTS THRU "CO-OPERATIVE ENGINEERING"
906-08 Sycamore Bldg. — Terre Haute, Indiana

PAUL WEIR COMPANY
Mining Engineers and Geologists
Consultants and Managers
DESIGN and CONSTRUCTION
20 North Wacker Drive — Chicago 6, Illinois

J. W. WOOMER & ASSOCIATES
Consulting Mining Engineers
Modern Mines Systems and Designs
Foreign and Domestic Mining Reports
National Bank Building — Wheeling W. Va.
Henry W. Oliver Bldg. — Pittsburgh, Penna.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

SEARCHLIGHT SECTION

(Classified Advertising)

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BUSINESS: :USED OR RESALE

UNDISPLAYED —RATES— DISPLAYED

$1.20 per line, minimum 3 lines. To figure advance payment count 5 average words as a line.

Position Wanted undisplayed rate is one-half of above rates, payable in advance.

Box Numbers in care of our offices count as one additional line.

Discount of 10% if full payment is made in advance for 4 consecutive insertions.

Equipment Wanted or For Sale Advertisements acceptable only in Displayed Style.

The advertising rate is $10.20 per inch for Equipment and Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request.

Employment OPPORTUNITIES—$12.80 per inch, subject to Agency Commission.

Send New Ads to N.Y. Office, 330 W. 42nd St., N.Y. 36, N.Y. for November issue closing October 17th

POSITION VACANT

Wanted: Qualified person to take charge of maintenance department, responsible for maintenance and repair of all underground equipment of large coal mining operation. Electrical or mechanical engineer preferred. Anyone interested should contact Inland Steel Company, Wheelwright, Kentucky.

POSITION WANTED

Maintenance Supervisor, Master Mechanic, chief electrician, machinery manufacturer or oil company representative. PW-7680, Coal Age.

BUSINESS OPPORTUNITY

Coal strip complete or equipment wanted. On royalty or tonnage basis. Pennsylvania, West Virginia, Ohio area preferred. Reply confidential Post Office Box 6903 Northside, Pittsburgh, Pennsylvania.

WANTED

ANYTHING within reason that is wanted in the field served by Coal Age can be quickly located through bringing it to the attention of thousands of men whose interest is assured because this is the business paper they read.

If there is anything you want **that other readers can supply**
OR . . . something you don't want— **that other readers can use—**
Advertise it in the
SEARCHLIGHT SECTION

POSITION VACANT

Graduate electrical engineer, preferably under 30, to work directly under the Superintendent of Power and Mechanical Department for the Wheelwright and Price mechanized mines.

INLAND STEEL COMPANY
Wheelwright, Kentucky

PURCHASING AGENT

Large industrial company, NYC, is interested in man under 32 with technical education and 3 or more years coal-mining experience for position in central purchasing dept. buying coal for power and process use. Send resume of education and work experience to

P7632—Coal Age
330 W. 42 St., New York 36, N.Y.

COAL MINING PLANT FOR LEASE

Coal acreage located in celebrated Connellsville region of Western Pennsylvania, a superior quality metallurgical fuel. Minimum investment required to place mine in condition for immediate operation. Mine equipped with coal washery, coke ovens, etc. Approximate capacity 600 tons daily.

Address: BO 7182—Coal Age
330 West 42nd Street
New York 36, N. Y.

WE HAVE JUST PURCHASED A LARGE MINE WHICH WAS FULLY EQUIPPED WITH BATTERY EQUIPMENT AND 220/440 VOLT AC EQUIPMENT. THIS EQUIPMENT IS NOW BEING OFFERED AT BARGAIN PRICES, SOME OF THE ITEMS ARE AS FOLLOWS:

3—8BU 11G, 220/440 volt AC

1—Baker-Raulang Battery Tractor

2—T2-5 PG, 220/440 volt AC Cat Trucks

8—32D Joy Battery Shuttle Cars, Batteries and Chargers—Good Condition.

2—52B Jeffrey 26" belt conveyors, 1,000 ft. Centers

2—7B Sullivans, 220/440 volt AC Cutting Machines

1—35B Jeffrey, 220/440 volt AC

1—212 G3 Baby Goodman, 220/440 volt AC

50—36" track gauge American Car & Foundry Drop Bottom Cars

3—36" track gauge Battery Locomotives

SHOULD YOU HAVE ONE PIECE OF EQUIPMENT OR AN ENTIRE MINE FOR SALE, PLEASE GIVE US A RING AND WE WILL MAKE INSPECTION, GIVING YOU A FAIR OFFER IMMEDIATELY.

BARGAINS IN DC MINING EQUIPMENT

1—20BU Joy Loader
1—14BU 7RAE Joy Loader
2—12BU 9E Joy Loaders
2—8SC Joy Shuttle Cars
10—9J, 24J & 38J, 250 volt DC Reliance Motors

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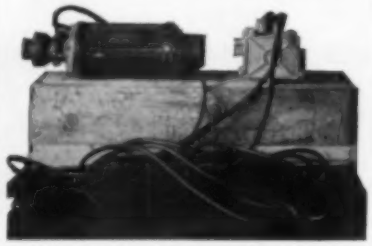
Melvin Adams

New Peerless Portable SUBMERSIBLE PUMPS



PUMP RATINGS: 120 GPM @ 63' total head; 200 GPM @ 47' total head; shut-off pressure 87' total head. MOTOR RATINGS: 4 HP, either 115 or 230 volts DC. Compound wound, class "A" insulation, constant speed, continuous duty, water cooled. Full load speed 3200 RPM. Between pump and controller, 115 volt models have 30' of 4-conductor type TCOP-23 cable, and 230 volt models have 45' of 3-conductor type TCOP-23 cable.

WEIGHTS: Pump, motor and strainer—120 lbs. net. Shipping weight of complete pump—180 lbs.

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P&H 655 B—Shovel #11576 22 ft. Boom—20' Sticks 1½ yd. Dipper Cat. Engine D-13000
Marion 40A—Dragline #8513 70 ft. Boom—3 yd. Bucket Light Plant-New Cummins Engine—Good Condition
P&H 955 Dragline #7941 2¼ yd. Bucket—Cat. Engine #D-17000 Good Condition
Marion 111M Shovel #8871 3¾ yd. Dipper—Twin Engine Diesel Light Plant—Boom 50' sticks
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500 KW (2) G.E. HCC6-275 v. DC 1200 RPM #4006716-7 with 3-200 KVA Transformers Type H-J-KDD 13800 volts (will rewind for any standard voltage)
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MOTORS, A.C. & D.C. ANY SIZE TRANSFORMERS, ANY SIZE.

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190-B B-E 8 yard electric shovel. Like new.
170-B B-E 5 yard electric high lift shovel.
170-B B-E Standard electric shovel.
1600 P&H 6 yard electric shovel.
2400 Lima H. L. diesel shovel 67' boom, 50' stick 4 yard dipper.
2400 Lima 6 yard electric shovel.
120-B Bucyrus-Erie electric 5 yard shovel.
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1201 Lima Hi-Lift diesel shovel 42' boom, 32' stick, 2½ yard dipper. Also drag.
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40-A Marion Hi-Lift diesel shovel 45' boom, 34' stick, 2½ yard dipper.
7400 Marion electric dragline 200' boom, 8 yard bucket.
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625 Page diesel dragline 150' boom, 9 yard.
621 Page diesel dragline 130' boom, 5 yard.
5-W Bucyrus Erie diesel dragline 125' boom, 5 yard bucket.
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4500 Manitowoc diesel dragline 120' boom, 5 yard bucket
1055 P&H diesel dragline 80' boom, 4 yard.
1201 Lima diesel dragline 85' boom, 3 yard.
3500 Manitowoc diesel dragline 85' boom, 2½ yard bucket.
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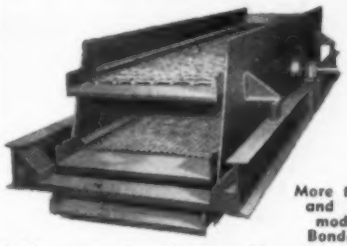
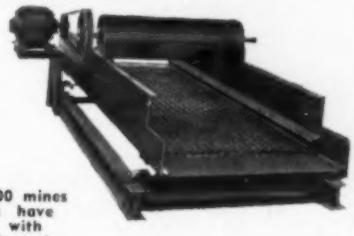
"For Continuous, Economical Screening of High Tonnages"





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Model Number	Screening Area	No. of Decks	List Price	Sale Price
238BS	3' x 8'	2	$1285.	$1165.
338BS	3' x 8'	3	1370.	1250.
248BS	4' x 8'	2	1881.	1695.
348BS	4' x 8'	3	2079.	1850.
2410BS	4' x 10'	2	1969.	1775.
3410BS	4' x 10'	3	2325.	2095.
3412BS	4' x 12'	3	2653.	2395.

Model Number	Screening Area	No. of Decks	List Price	Sale Price
124AS	2' x 4'	1	$403.	$355.
224AS	2' x 4'	2	435.	375.
226AS	2' x 6'	2	473.	395.
126AS	2' x 6'	1	449.	375.
136AS	3' x 6'	1	581.	495.
236AS	3' x 6'	2	665.	585.
336AS	3' x 6'	3	916.	815.
138AS	3' x 8'	1	685.	575.
238AS	3' x 8'	2	761.	695.
338AS	3' x 8'	3	959.	845.

For coal, mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.
HEAVY DUTY MODELS: 4-bearing, positive throw, eccentric shaft; 3'x8' to 5'x14' 1 to 5 decks.
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Heavy Duty Screens from $1165.00 **General Duty Screens from $355.00**

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Complete Ready-Fab sections quickly and easily joined together on the job. We take our loss on our stock of short length belting. You can save as much as 50% on the **BONDED CONVEYOR SPECIALS** listed, with conveyor belting in two pieces. Conveyors are equipped with 5" roll diam. idlers and return rolls, 20" diam. head pulley and 16" diam. tail pulley mounted on 2¾" or 2-7/16" diam. shaft. Belt is new 4-ply, 28-oz. duck, ⅛" top rubber cover x 1/32" bottom cover and is fresh stock made by leading manufacturers.

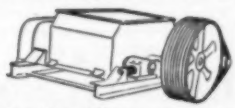
Remember, You Save Up To 50%

CONVEYOR PRICES BELTING INCLUDE

Belt Width	Length of Conveyor	List Price	Sale Price
18"	25'	$1327.	$ 739.
18"	45'	1986.	1085.
18"	60'	2575.	1354.
18"	100'	4000.	2065.
20"	25'	1366.	770.
20"	45'	2122.	1145.
20"	60'	2689.	1426.
24"	25'	1428.	835.
24"	45'	2227.	1237.
24"	60'	2826.	1549.
24"	100'	4425.	2339.
30"	25'	1535.	915.
30"	65'	3349.	1856.
30"	85'	4029.	2316.

Other lengths and belt widths at bargain prices

NEW BONDED® COAL CRUSHERS



Capacities from 20 to 500 tons per hour. Will crush to all sizes from stoker to 5". Take feed sizes to 24". Teeth designed to break coal sharp and clean with accurate sizing and minimum of fines. Double roll crushers with single and double drive; also single roll crushers. Hard cast rolls and gear, spring safety for tramp iron protection. Same model with corrugated and smooth rolls for cinders, chemicals, ag-lime, shells, etc. Complete with welded steel hoppers.
Priced from $479.00
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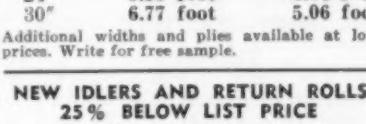
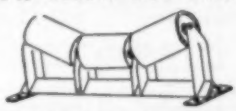
Heavy duty 4-ply, 28 oz. duck, ⅛" top rubber cover x 1/32" bottom cover rubber belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stock.



Width	List Price	Sale Price
18"	$4.27 foot	$3.19 foot
20"	4.69 foot	3.69 foot
24"	5.55 foot	4.14 foot
30"	6.77 foot	5.06 foot

Additional widths and plies available at low prices. Write for free sample.

NEW IDLERS AND RETURN ROLLS 25% BELOW LIST PRICE



3-roll, 5" diameter Troughing Idlers for

14" belt	$17.25	24" belt	$19.75
16" belt	18.00	30" belt	20.50
18" belt	19.00	36" belt	21.25
20" belt	19.25	48" belt	23.75

1-roll 5" diameter Return Idlers for

14" belt	$ 6.75	24" belt	$ 8.00
16" belt	7.00	30" belt	8.75
18" belt	7.50	36" belt	9.25
20" belt	7.75	48" belt	10.75

All steel. Interchangeable with other well-known makes. Replaceable ball bearings. Either sealed type (pre-lubricated) or with alemite fittings. Rust proof ball races. Maintenance is negligible.

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ADVERTISERS INDEX

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Choice of torque converter or oil clutch drive. First track-type tractor with Turbocharger. Completely new 286-HP engine. "Live-shaft" drive for rear-mounted equipment. Many other important features.

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With torque converter (Series D). With exclusive oil clutch drive (Series E). Completely new 191-HP engine. "Live-shaft" drive for rear-mounted equipment independent of flywheel clutch. New easy-working controls. Many other improvements.

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They're easier to service, too; an exclusive trouble-free oil clutch, separately removable power train components and a fuel system that needs no adjustments in the field are only three of many reasons why.

Better be sure you get *all* the news about the new D7, D8 and D9. Call your Caterpillar Dealer today. Or mail the coupon below.

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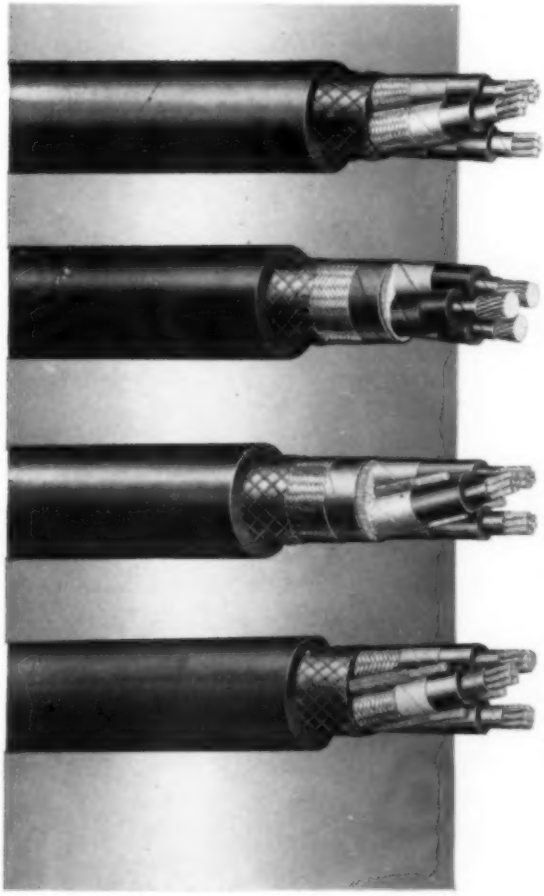
Shielded Portable Power Cables, Type SH, are preferred (or generally used) for the distribution of power to portable equipment at voltages above 2000. Shielded cables provide greater protection to the insulation and are safer to handle than other types of portable cables. These cables are of the four types listed below. Where maximum safety is desired, type SH-D cables are recommended.



U. S. Royal SH-A Cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S Uskorona-1 oil base compound, and covered with colored tapes and a braided coated copper shield. The conductors are then cabled and covered with a reinforced jacket of 60% black neoprene. The shielded braid over each insulated conductor eliminates corona cutting by static discharge through equalization of surface stresses.

SH-B cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound plus colored tapes. Conductors are then cabled with jute fillers, covered with a rubber-filled tape, a braided coated copper shield and reinforced 60% black neoprene jacket. The shielding braid protects the men handling the cable in the event of fault currents.

SH-C cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound and covered with a colored tape. The conductors are cabled with jute fillers and with the specified fabric-covered ground wires in the conductor interstices; then covered with a rubber-filled tape, braided coated copper shield and a reinforced 60% black neoprene jacket. This allows grounding of equipment and provides an adequate low-resistance path for short circuits, thus insuring circuit breaker operation. The grounded equipment provides protection to workmen under fault conditions.

SH-D cables consist of three or four flexible coated annealed copper conductors covered with a semi-conducting tape. Each conductor is insulated with U. S. Uskorona-1 oil base compound and covered with a colored tape and a braided coated copper shield. The conductors, together with fabric-covered grounding conductors, are cabled and covered with a reinforced black 60% neoprene jacket. The conductor shielding, when properly grounded, equalizes surface stresses and draws off all capacity charging currents, insuring safety in handling. An adequate low-resistance ground for the equipment is provided by the grounding conductors.

All shields and grounding conductors, when used, should be properly and thoroughly grounded.

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ELECTRICAL WIRE AND CABLE DEPARTMENT, ROCKEFELLER CENTER, NEW YORK 20, N. Y.

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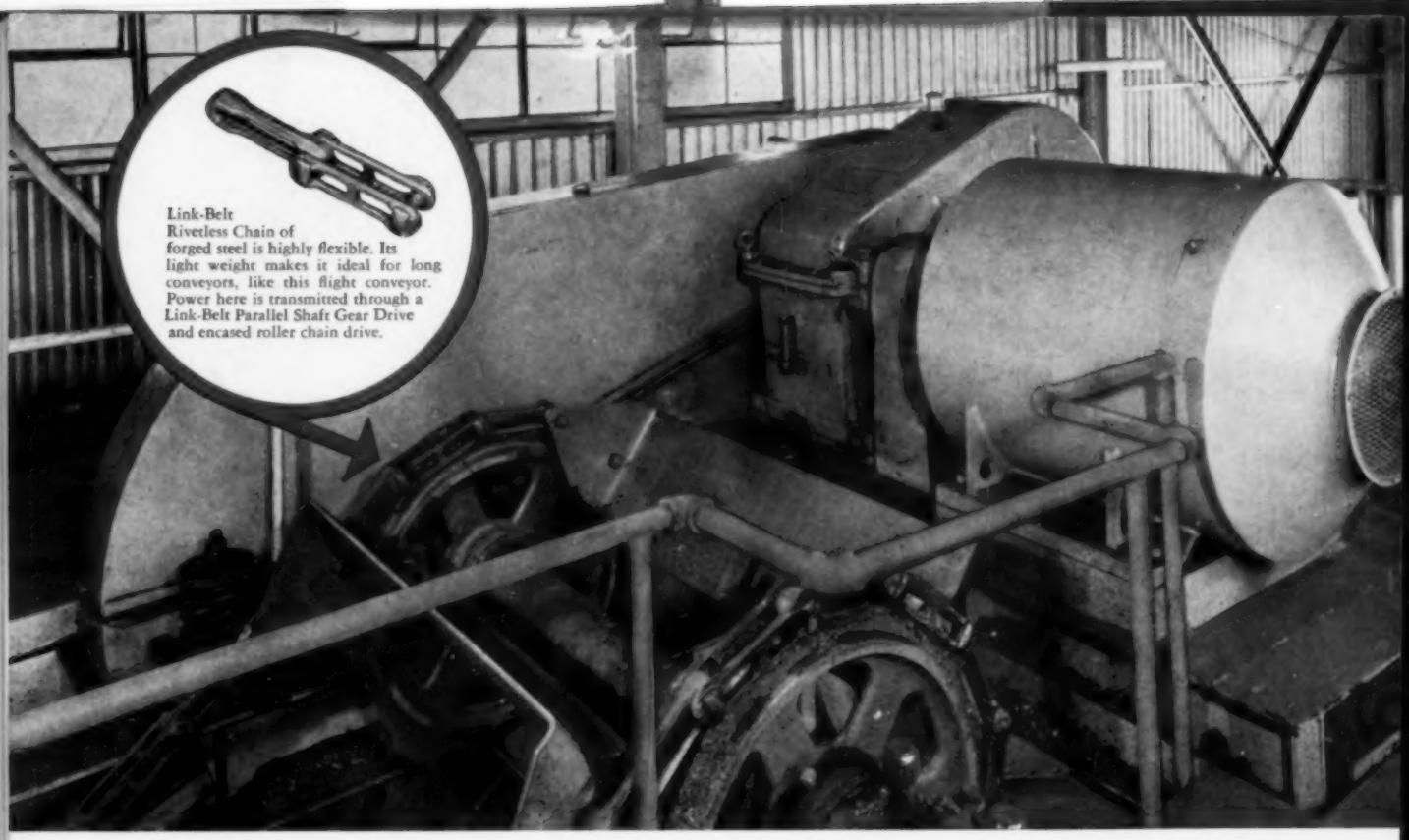

Link-Belt Rivetless Chain of forged steel is highly flexible. Its light weight makes it ideal for long conveyors, like this flight conveyor. Power here is transmitted through a Link-Belt Parallel Shaft Gear Drive and encased roller chain drive.

SIMPLICITY *plus* HIGH STRENGTH

makes Link-Belt Rivetless Chain RIGHT for coal handling

Here's proof that it pays to choose from the complete Link-Belt Line

This is a typical example of chain design that cuts conveying costs. The simplicity of Link-Belt Rivetless Chain permits dismantling by hand, *without tools,* to alter chain lengths or make replacements. And although it has the light weight desired for normal service, it also offers the high strength needed to meet sudden impacts and heavy overloads. It can be furnished heat-treated if desired.

Engineering refinements are the rule in every Link-Belt drive and conveying chain. And breadth of selection further assures the *best* answer for every requirement. In fact, no other single source can match the broad range of Link-Belt roller and silent chain . . . of cast, combination, forged and fabricated steel chains.

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